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THE
PETROLEUM AGE.

A MONTHLY MAGAZINE, DEVOTED TO THE INTERESTS
OF THE PETROLEUM TRADE.

VOL. VI.

FEBRUARY, 1887, TO JANUARY, 1888.

BRADFORD, PA.
J. C. McMULLEN, Publisher,
1888.

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THE PETROLEUM AGE.

VOL. VI.

BRADFORD, PA., FEBRUARY, 1887.

No. 1.

THE MOUNT MORRIS MYSTERY.

E. M. HUKILL & CO.'S OPERATIONS IN GREENE COUNTY
AND WEST VIRGINIA—THE WORK OF
OTHER OPERATORS.

ON the morning of the last day of the old year the writer started from Pittsburgh for the Mount Morris well. From the Smoky City, which has already become the centre of the oil fields that furnish the sensational developments which move the oil market there are several ways of going to Mount Morris.

1. When the Monongahela river is free from icy fetters a boat may be taken at Pittsburgh at four o'clock in the afternoon, which lands at Greensboro between seven and eight o'clock the next morning. From this point a drive of twelve miles brings you to Mount Morris. This is the route usually taken by Mr. Hukill and his lieutenants. They have fixed on this town as their base of operations, and have built commodious stables and opened an office here. The town has good hotel accommodations, and is said to be a desirable landing place in traveling to and from the Dunkard creek section. It has the proud distinction of being the birthplace of the noted humorist and prince of kind hearted fellows, "Bob" Burdette. Not long ago, when Mr. Burdette was billed to lecture in Waynesburg, and was unavoidably detained on the road, and made a late appearance, he excused himself by telling his audience that the first time he ever came into Greene county, several old ladies waited nearly all night for him, and that he cried on his arrival. Another route lies by the way of the old town of Washington. A ride of thirty-seven miles over the Baltimore & Ohio Railroad, or the Chartiers Railroad, carries one from Pittsburgh to the antiquated town of Washington. Then a ride over the Washington & Waynesburg narrow gauge of twenty-nine miles brings you to Waynesburg, the county seat of the Democratic county of Greene. A stage coach runs on Tuesdays, Thursdays and Saturdays from Waynesburg to Mount Morris. The fare from Pittsburgh to the seat of operations via this route is three dollars. One dollar from Pittsburgh to Washington, a dollar to the narrow gauge company and another to the stage driver, who gives you a whirl of sixteen miles over the hills from Waynesburg to Mount Morris. One can also go from Pittsburgh to Uniontown, and then to Fair Chance, and take the stage which runs from there through Greensboro to Morgantown. Or take the Baltimore & Ohio Railroad from Pittsburgh to Morgantown, and drive from there to Mount Morris, a distance of ten miles. In driving from Morgantown to Mount Morris, one of three roads can be chosen, but no matter which one is taken the tourist will wish that he had taken one of the other two roads. The AGE representative, who wished to stop at Washington, took that route. In going this way one finds the

little narrow gauge, which winds its way among and over the hills of Washington and Greene counties, a sort of a base line for wild-cat oil operators.

Ten miles out of Washington, on the west side, and near the railroad, at Baker's Station, Colonel Dyer and Dr. W. B. Roberts are drilling a test well. They have struck a vein of mineral water at a depth of 1575 feet, which requires them to bail an hour to lower it after a bit has been run. It has a rusty color, and the AGE scout would suggest that the doctor use it for Congress water up in his "deestricht." According to Mr. John M. Ruple, a civil engineer of Washington, Pa., who is pretty well acquainted with the rock structure of the county, the Dyer & Roberts well is located in the bottom of a synclinal and is likely to get salt water or oil.

The next feature of interest to the oil man is the Ten-Mile Oil Company's gas well, on the Maloy farm, near West Amity Station, three miles south of the well at Baker Station. It sends forth a huge flame which is fringed with a dense black smoke that indicates the presence of oil. The Pittsburgh coal vein was struck at this well at a depth of 465 feet, and oil in small quantities was found at a depth of 932 feet, and in the "Big Injun." One of the owners said he thought the oil came in with the gas, which was tapped at a depth of 2380 feet. The Ten-Mile Oil Company have 2400 acres of land leased in the vicinity of their well. This gasser will become a feature of interest, as the Dyer & Roberts well, at Baker Station, on the Washington & Waynesburg Railroad, nears the sand. For years gas has been seen ooze from the ground in many places in the neighborhood of West Amity Station.

Parties going to the Johnston & Hamilton well, at Ninevah, leave the cars at Deer Lick Station, twenty miles by rail out of Washington, and go due west two and a half miles. This well struck an unexpected cave at 1300, and on January 10th was shut down waiting for the casing puller to draw the casing.

At Sycamore Station, twenty-four miles via narrow gauge from Washington, and five miles from the county seat of Greene county, Willets & Co. have a new rig standing on the west side of the railroad track, and near the depot. The farm upon which the derrick has been built goes by the name of the Loughman. A walk of a mile and a half up Brown's Fork, in a northwesterly direction, and the test well of Willets, Garrison & Co. is reached. It is located on the O. S. Phillips farm, near an old mill which does its daily grind under the name of Sargent's Mill. On December 31st this well was down over 1900 feet and was drilling in hard sand. Gas enough in the Big Injun had been struck to fire the boiler. On the 21st of January the drill was vibrating 2530 feet below the surface and no show of oil had been discovered. Up to that time, the Gantz sand and fifty-foot, two of the regular oil bearing rocks of the Washington field, had not been encountered. In volume K, of the Pennsylvania Second Geological Survey, the depth of the Waynesburg coal is given at 420 feet, and the

Pittsburgh coal at this point is 330 feet below this, which would make the depth of the Pittsburgh coal at the Sargent Mills well 750 feet. In the Washington oil field it is 1800 feet from the Pittsburgh coal to the Gantz sand. Hence if the depth given in the survey is correct, the top of the Gantz sand at this well should be reached at a depth of about 2550 feet. It was the intention of Mr. Willets to drill the well to a depth of 2700 feet. In this section Messrs. Isaac Willets, J. L. Garrison, T. M. Hennen and others have a large amount of land leased.

At Waynesburg, the county seat of Greene county, a well has been drilled to a depth of 2700 feet without finding oil or gas in paying quantities. This venerable town needs such an awakening as an oil excitement usually imparts to a place of its kind. Like Washington it is a temperance town, but when you arrive, if you are an oil man, and below Pittsburgh all men who come from the region are oil men, you are asked to take something. Waynesburg has a population of about 2600 and has a location which insures it good drainage and healthful surroundings. Coal is so abundant and can be procured at such a low rate, that up to date the old town has not indulged in the luxury of natural gas. "I reckon its pretty icy," the stage driver said the other afternoon, as I mounted the front seat of the vehicle and seated by his side started for Mount Morris. And so it proved. In descending the abrupt slope of the lofty ridges, which the road crosses, the passengers got out and either held on to the rear end of the wagon to keep it from sliding down the hillside, or saw the driver whip his horses into a run and dash over the smooth, frozen road before the coach could slip sideways and have its centre of gravity reversed. After a four hours' ride we sight Mount Morris, the village from which the Hukill well takes its name. It is situated in the southeastern part of Perry township, in Greene county, and on the south side of Dunkard creek, and about one mile from the State line. By wagon road the town is sixteen miles from Waynesburg, twelve miles from Greensboro, on the Monongahela river, and ten miles from Morgantown, the county seat of Monongalia county, West Virginia. Its population is about 325, and the village has two hotels, and the usual number of stores for a place of its size. Like many of the towns in the oil fields, about and below Pittsburgh, it has age in its favor. According to the log book of a venerable resident, the town was laid out by Levi Morris in 1820. At that time an old stone mill occupied the place where John Kennedy's mill now stands, and this structure and the miller's house were the first buildings upon which the leaf shadows of the wild woodland fell. A postoffice was established at this point quite early in the town's history, and with a mill, postoffice and stores the place became a centre of trade and gradually assumed its present dimensions.

THE SOUTHWESTERN SECTION.

Since oil was struck in the deep sands of the Washington fields oil operations have been drifting to the south and southwest, and the wild-catter is over running the southern country, which is in range with the oil pools to the northeast in Pennsylvania and New York. That portion of Greene county in which Mr. Hukill is sinking for nature's buried oleaginous treasures, lies to the east of the oil range, and for this reason a prominent geologist has expressed an opinion which is adverse to the prospects of finding oil in large quantities in the southeastern part of the county.

The story of the Dunkard creek oil excitement runs almost as far back in the annals of petroleum history as

that of Oil creek. In the early sixties when the rebel hordes were recruiting horses for the cavalry service on the headwaters of Dunkard creek, the oil operator was drilling for oil a few miles down the stream and across the State line in Pennsylvania. On the 5th of January an AGE representative met Mr. John Finley Thompson on the road near the Mount Morris well, and beguiled him into a line of talk concerning the history of E. M. Hukill & Co.'s operations in Greene county. After repairing to the watch house, along side the boiler, where the bright glow of a soft coal fire was causing a genial warmth to radiate throughout the rude structure, the writer took a seat upon the straw bed upon which the weary watchman reclines during the lone hours of the night and listens for the foot fall of the land scalper and oil scout. In passing it might be noted that the conspicuous feature in the appointments of that shanty was a large size Smith & Wesson revolver, which hung against the side of the shanty, and within convenient reaching distance of the guard. After assuring the interviewer in positive and emphatic terms that he would say nothing about the Mount Morris well, Mr. Thompson hastily outlined the history of their operations in Greene county. "Fin" Thompson, as he is called by his friends, is well-known on Oil creek, later in Clarion county and in the Bradford field, where he operated for oil. As Mr. Thompson seated himself on a pine box, which he had inverted, he said: I left Oil creek in 1864 and came to Greene county to drill by contract for the Pittsburgh and New York Oil Company. This company, of which General Negley, of Pittsburgh, was president, continued Mr. Thompson in the business of drilling at three dollars per foot and furnished him with a contractor's supply, until the company became an object of interest to the Sheriff of the county. Mr. Thompson said that when he retired from the Dunkard creek field in 1864 that he made up his mind to come back at some time in the future and get even with the county. During the latter part of the year 1884 he accepted a position as field man with the Carpenter Gas Company, in which Mr. E. M. Hukill was the prime mover. W. H. Shackelton, the well-known oil operator and pipe line man, was superintendent of the lines of the Carpenter Gas Company. Early in the year 1885 this experienced trio frequently discussed the oil possibilities of Greene county. Mr. Thompson, who was thoroughly familiar with the old developments from the early days down to the time when the Tanner well, on the Garrison farm, was struck advocated the existence of oil in the lower sands, and held that the crude which had been produced from the Dunkard or Mahoning sandstone, had come up from the overcharged rocks below. Soon after the Carpenter Gas Company was sold to or merged with the Westinghouse or Philadelphia Company, Mr. Thompson came to Waynesburg and made a pedestrian tour to Greensboro. On his return to Pittsburgh he made a favorable report on the oil prospects of the county, and Mr. Hukill concluded to back the opinion of his enthusiastic field man with the necessary capital, and on the 10th of April, 1885, Thompson began to take leases in the vicinity of Willow Tree. The first farm leased was that of Stephenson Garard of 200 acres. Leases covering 1000 acres were soon secured. A. P. Tanner & Co., or the Osceola Oil Company, turning over some of their old leases to the new company, and on the 27th of April Hukill & Co. began to build a rig on the Garard farm, and on the 21st of August the well was tubed and began producing a small amount of oil from the Dunkard sand. Starting at Willow Tree the company have taken

Theory

1885
27th
21st

up lands in a northeasterly and southwesterly direction until their leases comprise an area of 40,000 acres. Beginning at Carmichaels, in Cumberland township, within three miles of the Monongahela river, they have leased a belt of land extending for thirty-five miles in a southwesterly direction, and as far into West Virginia as the northern boundary line of Harrison county. In order to prosecute the work on a comprehensive plan a 30° line was run in a southwesterly direction from Carmichaels to the West Fork of the Monongahela river, a distance of thirty-five miles. This line having a magnetic bearing of S. 30° W. was used as a base line of operations, and lands were secured from three to six miles on each side of it. According to Mr. John M. Garard, the gentlemanly representative of the firm, who leased between 20,000 and 25,000 acres of lands along the 30° line in West Virginia, this line starts at Carmichaels, and in its southwesterly course passes one-quarter of a mile east of Willow Tree. Its position at Mount Morris is about 1000 feet east of the well, and between a quarter and a half mile east of the town. After crossing Mason and Dixon's line it runs a half mile west of Cassville, and further south it traverses the middle ground between Farmington and Barrackville. Over this long distance of thirty-five miles there are localities where they have leased solid blocks, while in others they have broken sections. Most of the farms and tracts are leased on the rental plan, and one well drilled in some neighborhoods tests and holds a large amount of land.

Since the Garard, No. 1. was begun six other wells have been started in the following order:

(At some time in the future, when inside information concerning Greene county wells is more easily accessible, these wells may be detailed and reviewed in the AGE.)

The Garard, No. 2, has been drilled to a depth of more than 1000 feet, and is dry in the Dunkard sand.

The company's well, on the James Fordyce farm, southwest of Willow Tree, on a branch of Whiteley creek, has been drilled to a depth of 1300 feet and is dry in the Dunkard sand.

The fourth well drilled by E. M. Hukill & Co. is located on the Corbly Gregg farm, near the country tavern, at Willow Tree. It is cased with four and a quarter inch casing and has been drilled to a depth of more than 2000 feet. It has been fishing since April 1, 1886, and is dry in the Dunkard sand, and in the rock where the Mount Morris well gets its oil.

The fifth well started by the company is located on the John Hathaway farm, about four miles northeast of Mount Morris, and near the 30° line. The Dunkard sand was found to be barren of oil at this well, and after the owners concluded to sink it to the level of the deep sands it was necessary to ream down and case with large pipe. After a long siege at fishing the contractors have abandoned the well and their contract.

The Mount Morris well—the midnight, midday, autumn and winter mystery—is a chestnut, to use the vernacular of Chris. Roess, of Oil City, but sometimes a chestnut is warmed over when it falls into the hands of such a bear as "Bill" Thompson, of Bradford. This well is located on the D. L. Donley farm, on Morris run, a branch of Dunkard creek, and a short distance southeast of the town of Mount Morris. It is about forty feet from the highway and its location has been a serious obstacle in the way of its being worked as a mystery by Mr. John Finley Thompson. The drill was started March 2, 1886,

and oil was struck between seven and eight o'clock on the evening of October 20th. The drill kept vibrating until about nine o'clock on the following morning when the well made a flow. It continued to flow every day during the remainder of that week when it was shut in. Since that time it has been reamed down, cased deeper and plugged. The depth at which the oil was struck and the sand in which it was found is kept a mystery by the owners, but it is not regarded as such by the painstaking investigators, called scouts. They are quite sure that the oil was found at a depth some where between 1740 and 1800 feet, but are in doubt as to whether the crude comes from the bottom of the Big Injun or the "thirty-foot," which is below that sand. The well remained plugged until the 25,000-barrel iron tank was completed, when it was learned that the plugs were to be drilled out. They began drilling on Friday, December 24th, and at noon on Friday, December 31st, W. R. Smith, the only scout on duty at that time, declared the plugs out. Up to Saturday night, January 1st, three bits were run in the sand, but no improvement in the well could be discovered. From that time until the afternoon of January 5th the tools were raised and lowered twice each day, and the well was bailed daily, but no drilling was done. During this time the well was only seen to flow when the tools were run and when the bailing was done. The scouts who watched the well from the first to the fifth of the present month estimated its production from 15 to 20 barrels per day. When the writer left the well on the evening of January 5th they had hauled two loads of tubing to the well and were going to pack it as soon as enough tubing was obtained. The owners do not consider the well completed yet, as it still has a chance to get oil in the Gantz, fifty-foot and Gordon rocks, the deep sands of the Washington field. When the barriers are removed and the avenues of information can be traveled with less friction and greater ease the scribe who pencils these lines hopes to give a better account of the Mount Morris mystery.

The seventh well drilled by E. M. Hukill & Co. is known as the Farmington well. It is located on the John C. Gallihue farm, along Davy's run, on the north side of the Baltimore & Ohio Railroad, and midway between the town of Farmington and Barrackville, in Marion county, West Virginia. It is on the 30° line and about twenty miles southwest of Mount Morris. This wild-cat well became widely known through the pocket of gas which was struck at a depth of 2590 feet. The vapor came with such force that it raised the tools out of the hole. They fell back into the well about eight feet and bent over against the side of the derrick. This gas which came with a mighty rush died away in four days so there was not enough left to run four boilers. At this well the Pittsburgh coal, the keyrock of the southwest, was reached at a depth of 360 feet. The well was cased with about 700 feet of seven and five-eighths pipe, and with 1480 feet of five and five-eighths. The Gantz sand was found at the regulation depth, and the fifty-foot of the usual thickness occupied its regular place. The Gordon sand, eighteen feet thick, was encountered in its proper place on the geological scale. The drill stopped at a depth of 2810 feet, the casing was pulled and the hole abandoned.

THAT IRON TANK.

The building of a 25,000-barrel iron tank on the Donley farm, across the road from the well, has given the Mount Morris venture a prominence which it could not have gained by gushing 1000 barrels per day. In the landscape of the Dunkard creek section, this almost

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hollow receptacle for crude, is a conspicuous feature, but in the minds of the bears all the way from Gotham to the Smoky City it has loomed up more grandly than it does from its elevation on Morris run, where its bright red hue contrasts strongly with its setting of snow. This tank has caused a vast amount of comment and free criticism on the motives of the builders, and at this writing the real cause of its construction is a matter of conjecture, as the owners could have had a pipe line by the asking. It is the oil which the tank is built to hold and not the hollow iron rim that will depress the market if the crude in depressing quantities is found. The tank will be a storage saving institution, and the distance on an air line to the Monongahela river is about seven miles. Should any pipe line enter the field the tank could be sold for the cost of constructing one of similar proportions, and in case the owners should care to offer stock in Greene county oil territory for sale in Eastern cities it would weigh heavily as assets. Sometimes, even in oil operations, there is method in what seems to be madness. It would be well to keep an eye on the drift of developments in the future before the final verdict on E. M. Hukill & Co.'s iron tank is reached.

OIL REGION CHRONOLOGY.

FOR JANUARY, 1887.

January 1.—Holiday. No market. AGE oil report shows 189 wells completed in December, 52 of which are dry; new production, 4126 barrels, new rigs, 74; old rigs, 133; drilling wells, 239; total field operations for December, 446; decrease from November figures, 95. Lima field completed 28 new wells with a production of 2760 barrels. Findlay reports 17 wells completed in December, making 40 producing wells now in the field. Newsboys of Oil City enjoy a New Year's dinner at the expense of Captain Vandergrift. Franklin builds a toboggan slide.

January 2.—Sunday.

January 3.—Market opened firm at 70c and advanced to 70½c, broke to 70¾c, reacted to 71¼c, sagged off to 70½c and closed at 70½c. Carrying rates 55 to 65c. Darragh, Watson & Co.'s well, on the James McCoy farm, Shannopin, showing for 300 barrels. Burchfield well, Broell farm, Reibold field, proves a failure. Snow blockade on railroad between Mt. Jewett and Kane. Election of officers at Bradford Oil Exchange; C. L. Wheeler re-elected President, Vice-President, J. E. Haskell; Secretary and Treasurer, Winfield Scott.

January 4.—Market opened strong at 70¾c, advanced to 71¼c, sold down to 69¾c and closed at 69¾c bid. Washington gauge 7750 barrels. McCoy farm well of Darragh, Watson & Co., Shannopin, made 170 barrels in twenty-two hours, when one bit in the sand. Raccoon, Alexander farm, No. 4, through sand and dry. Lease fight at Findlay between Duke Oil Company and Trenton Oil Company, over a ten-acre tract. Two brakemen seriously injured by accidents on P. & W. R. R.

January 5.—Market opened at 70c, weakened to 69½c, advanced to 71¼c and closed at 70¾c. Carrying rates 55 and 60c. Mt. Morris well drilled through sand and doing 16 barrels a day. Washington—Production, 7600 barrels. Fair ground well, No. 3, nearly through sand with light showing. W. G. Fee well, Ridenour farm, Lima, shot and made 600 barrels in fourteen hours. The Andrews block, at Youngstown, O., destroyed by ex-

plosion of natural gas which leaked from gas main in the street; loss, \$100,000.

January 6.—Market opened at 70¾c, advanced to 71c and broke to 70½c. After many fluctuations between 71c and 71½c it firmed up to 72c and closed at 71¾c bid. Washington—Barre, No. 11, makes a small flow.

January 7.—Market opened steady at 71¾c, with sales at 71¾c, broke to 70¾c and closed at 71c. Washington—Production 7500 barrels. Barre, No. 11, drilling in the "fifty-foot" and flowing by heads. Residence of Dr. Dillaubough burned at Olean. Another cold snap; thermometer reaches 25° below zero at Bradford.

January 8.—Market opened steady at 71½c, advanced to 71¾c, sold off to 70¾c and closed at 71c. Washington—Production, 7425 barrels from 122 wells. Davis, No. 5, largest well, 530 barrels; Barre, No. 6, 480; McGahey, No. 5, 432; Reid, on Miller, 408. Barre, No. 11, 54 barrels a day. Lafayette Steiger killed on the Erie road, at Bradford, while switching cars.

January 9.—Sunday.

January 10.—Market opened at 71½c, advanced to 71¾c, sold off to 71¾c, reacted to 71¾c and closed at 71¾c. Carrying rates 60c. Washington—Production, 7250 barrels. Caldwell well, on McKean lot, filled up 1500 feet with oil. Willets, No. 12, shot and increased to 16 barrels an hour. Death at Pittsburgh of T. J. Craig, President of the Hazelwood Oil Company, aged 56 years.

January 11.—Market opened firm at 71¾c, receded to 71¾c, advanced to 72¾c and closed at 71¾c. Washington—Gordon, No. 1, down to 8 barrels a day. Death of Joseph Van Vleck, a well-known oil operator, aged 78 years, at Titusville.

January 12.—Market opened at 72c, the highest point, weakened rapidly to 71c, advanced and closed at 71¾c. Washington—Production, 6800 barrels. Reid well, on Pollock farm, in advance of McGahey pool, drilling in Gantz sand, with no oil nor gas. Well at Mt. Clemens, Mich., reported flowing 500 barrels a day. Explosion of natural gas injures several firemen at Pittsburgh.

January 13.—Market opened at 72c, sold down to 71½c and closed at 71¾c. Washington—Pollock farm well gets a big flow of gas in top of the "fifty-foot." C. E. Vosberg, a wealthy young man of Warren, found dead in the Bradford station house.

January 14.—Market opened at 71½c, and broke with scarcely a reaction to 68c. It then reacted to 69¾c, and later touched 70c. It broke again to 69¾c, but rallied and closed at 70¾c. Carrying rates—New York, 40c; Bradford and Pittsburgh, 55c; Oil City, 65c. Washington—Pollock well through "fifty-foot" and dry. Hon. Charles W. Stone, of Warren, appointed Secretary of State by Governor Beaver.

January 15.—Market opened weak at 70¼c, sold off to 70¾c, firmed up to 71½c and closed at 70¾c bid. Carrying rates, 60 and 70c. Washington—Davis, No. 7, strikes fresh pay streak and starts at 25 barrels an hour. Field gauge, 8640 barrels from 127 wells.

January 16.—Sunday.

January 17.—Market opened at 70¾c, with sales at 70¾c, then advanced to 71½c. It declined to 71¼c, reacted to 72c and closed at 71¾c bid. Washington—Davis, No. 7, increased to 68 barrels an hour. Gauge at 7 a. m. showed 530 barrels production for twenty-four hours. House of John Kelley, on Terrace avenue, Bradford, burned. First organ completed at Oil City.

January 18.—Market opened at 71¾c, weakened to 71¾c, advanced to 72¼c and closed at 71¾c bid. Boyer,

Simpson & Co.'s No. 2, warrant 3663, Elk county, torpedoed and pronounced good for 10 barrels a day.

January 19.—Market opened strong at 72c, advanced to 72½c, broke to 71¾c, reacted to 72¼c and closed at 72½c. Washington—Davis, No. 7, falling off rapidly, reported down to 35 barrels an hour. At Canonsburg the Bebout well is flowing 4 barrels and McCowan pumping 18 barrels a day. An oil strike reported at Latrobe.

January 20.—Market opened at 72c, weakened to 71½c and closed at 71¼c. Carrying rates, 50 and 55c. Washington—Davis, No. 7, increased from 27 to 37 barrels an hour. Barre, No. 7, 15 feet in the sand and has made two good flows. James Hawkins, night fireman at the Union refinery, Oil City, stabbed in the back by "Sandy" Jones. Descart Gage, a boy of 15, has his skull fractured by falling from a train at Crawford Junction, McKean county, and dies from the injury.

January 21.—Market opened at 71½c, weakened to 70½c, firmed up to 71¼c and closed at 71½c. Washington—Willets, No. 28, through the sand and making 50 barrels a day; shot with 40 quarts and increased to 15 barrels an hour. Davis, No. 7, doing 30 barrels an hour. Reported discovery of oil at Smithfield, near Steubenville, Ohio, at a depth of 1600 feet.

January 22.—Market opened at 71½c, advanced slowly to 71½c, declined to 71c and closed at 71½c bid. Carrying rates 50 and 55c. Washington—Gauge 7880 barrels from 129 wells. Pew & Emerson's No. 3, Manifold, dry in mountain sand. McKeown, No. 11, starts flowing. Caldwell well, McKean lot, makes it first flow.

January 23.—Sunday. Mrs. Thomas Horner, of Pittsfield, commits suicide by drowning in the Brokenstraw creek.

January 24.—Market opened at 71½c, firmed up to 71¼c, broke to 70½c and closed at same figure. Washington—McKeown, No. 11, doing 16 barrels per hour. Ice blockade on Oil creek, at Rynd Farm, causes great inconvenience and delays trains on the B., N. Y. & P. R. R. Four children of Mr. and Mrs. H. L. Ross, burned to death in their house at Fern City, in Clarion county. House of James Munro, at Renfrew City, Butler county, burned to the ground.

January 25.—Market opened at 70½c, advanced to 70¾c, weakened to 69¾c, reacted to 70c, broke to 69¾c and closed at 69¾c. Washington—Central Oil Company's No. 3, Martin farm, 25 feet in the sand with hole full of oil. Willets, No. 22, 40 feet in sand with 1200 feet of oil in the hole, McKeown, No. 11, making 8 barrels an hour.

January 26.—Market opened at 70c, firmed up to 70¼c, declined to 69¾c, advanced to 70¾c and closed at 70½c bid. Washington—McKeown, No. 3, Martin farm, 12 bits in the sand and flowing every hour. One boy killed and another fatally injured by the explosion of a boiler on Wolf & Kugler's lease, in Egypt district, Venango county.

January 27.—Market dull and featureless; opened at 70½c, highest point of day, declined to 70¼c, advanced to 70½c and closed at 70¼c. Carrying rates 50 to 60c. Washington—McKeown, Martin, No. 3, made 372 barrels last twenty-four hours. Phillips, No. 2, Heid farm, Reibold, starts at 30 barrels an hour. Large fire at North Warren destroys three business houses, two barns and one residence.

January 28.—Market opened at 70c, sold off to 69¾c, advanced to 70¼c and closed at 69¾c. Washington—Associated Producers' No. 3, Martin farm, 33 feet in the sand with no show of oil. McKeown's No. 3, Martin,

made 322 barrels the past twenty-four hours. Butler & Co., on Watson lot, 20 feet in sand with no oil. Oil City agitated by a little scrimmage between an editor, a minister and an oil producer, in which the editor seems to have had the best of it. James D. McNiell falls from the top of Christ Church, Oil City, a distance of 42 feet and is killed.

January 29.—Market opened at 70c, firmed up to 70½c and closed at 70½c bid. Carrying rates 50 and 55c. Washington—Gauge 7765 barrels from 134 wells. Producers' No. 3, Martin, (McGahey pool), dry in the Gantz sand. Davis, No. 7, reached lower paystreak and made 100 barrels first hour, 88 the second and 75 the third. Oil City jubilates over first organs manufactured at that place.

January 30.—Sunday.

January 31.—Market very dull; opened at 70½c and closed at 69½c. Washington—A. P. Co.'s well, on Martin farm, filling up with oil from top of "fifty-foot." Davis, No. 7, 42 barrels an hour from bottom of lower pay streak. Butler & Co.'s well, on Watson lot, made 14 barrels past 48 hours.

Crude Market for January.

The past month in the petroleum market proved tame and uninteresting. The news from the field has had little effect upon prices, which have been kept within circumscribed limits, by the work of one or two prominent operators on the New York floor. It is clear that the powers that rule the speculative market are not favorable to a sudden advance at the present time. Prospects of additional production at Taylorstown, and more gusher territory at Reibold, are sufficiently good to cause investors to steer clear of the oil certificate, while the Lima field presents another problem of which no one seems reasonably certain of the solution.

The month opened with the market at an even 70 cents at all points, and closed at 69¾@69½c. On the 11th the price reached 72½c, and on the 14th sank to 67¾c. These two points represent the extremes of the market for January. During December it ranged between 81¾c and 65½c.

The range of prices for January was 4¾c as compared with 16¾c in December, 14½c in November, 4¾c in October, 4¾c in September, 6½c in August, 3¾c in July, 8¾c in June and 12½c in May. The average price on the floor of the Bradford Exchange was 71c in January, 71c in December, 72c in November, 65½c in October, 63¾c in September, 62c in August, 66c in July, 67c in June, 69¾c in May, 74c in April, 77½c in March and 80c in February. The average price for January one year ago was 88¼c.

THE CLEARANCES.

	January. Barrels.	December. Barrels.
Bradford Oil Exchange	26,170,000	41,498,000
Oil City	53,746,000	94,519,000
New York Consolidated Exchange	111,951,000	194,305,000
Pittsburgh Petroleum Exchange, est.	51,634,000	90,000,000
Philadelphia Oil Exchange	17,159,000	25,068,000
Total	260,660,000	445,330,000

Oil City Tube Company.

The main building of the Oil City Tube Company is to be 201½x303 feet, with corrugated iron roof and sheet iron sides. The value of the iron in the building will be nearly \$9,000. The company is composed of energetic men, with large capital, and located as it is in the heart of the oil and gas region will enter the lists with everything in its favor.

POCKET maps of Warren county on sale at AGE office.

THE FOREIGN SITUATION.

STOCKS ABROAD AND THE REFINED MARKET.

THE following facts in regard to the refined market at London and the stocks in foreign ports for the past year and the years preceding are compiled from Mordaunt Brothers' (London) Annual Petroleum Circular:

Amongst the notable events of the past year must be placed the Russian "scare," which, having agitated the political world and baffled and bewildered the diplomats and governments of Europe has also hung like a vampire over the petroleum trade. A second prominent feature has been the development of the bulk system of transport in tank ships both from America and Russia. Such a system possesses undoubted advantages and is destined in time to gradually supersede the present plan of shipping cargoes in wooden barrels, and most likely will lead up to restrictions in the storage in wood of such a large quantity of petroleum at the London wharves. A third noteworthy event was the formation, late in the year, of a triumvirate, uniting the joint interests of the principal owners of petroleum at hand and afloat. The design aimed at artificially raising prices, not only by force of monopoly, but by aid of strategy. It was calculated that if the December tenders were withheld those who had oil purchased would be compelled to buy again to supply their pressing wants. So far as we can see, no material benefit accrued to the triumvirate, and a vast amount of inconvenience was caused to the trade. The whole scheme was feeble in its inception; nerveless in its manipulation; and ridiculous in its conclusion.

The total shipment from the United States to all parts of the world was:

	Gallons.
1886.....	544,301,183
1885.....	515,831,935
1884.....	504,163,862

Curiously enough, notwithstanding Russian competition, there is no falling off in the total shipment to notice. As regards the quality we are glad to say it has given general satisfaction, although we are bound to add there have been complaints of some of the new brands. The question of petroleum as a fuel continues to receive considerable attention, but no great progress has yet been effected.

The Petroleum Association, alive to the necessity of gaining information and acquiring knowledge on subjects connected with the trade, were represented at the Russian Oil Conference at Baku, by Colonel Stewart. It was also considered advisable to depute their secretary, Mr. Boverton Redwood, to accompany Colonel Majendie, the Government Inspector, in a visit to the United States, undertaken for the purpose of investigating the system in vogue in America for storing and dealing in petroleum. The information gained is intended to be utilized by the government in framing the new petroleum bill, which is expected to be introduced this session.

The course of prices, it will be seen, has been most erratic, and a lower scale has ruled than has been known for several years. This is the outcome of causes previously alluded to. At the commencement of the year we held a stock of 98,483 barrels and a price nominally of 7d, which soon declined to 6½d, as it became apparent that the attempt of a syndicate to control the market would end in a fiasco. The result was a heavy drop to 6 1-16d by the middle of the month, but speedily recovered to 6¼d. In February again backing to 6 1-16d,

and to 5 13-16d by the middle of the month. A reaction then took place and 6d was again made, only to speedily give way to 5¾d, which was the ruling price throughout March and April. Recovering slightly at the commencement of May, when stocks were at a very low ebb, but again giving way to 5¾d, and to 5½d to 5 9-16d by the end of month, which was maintained during June and July and the greater part of August, at which time the destruction of about 6000 barrels by fire at Dudgeon's wharf imparted a firmer tone and the price rose to 5¾d. This rise was short-lived, and it soon fell to 5½d, and early in September to 5 7-16d, again improving by the third week of the month to 5¾d, but suffering a relapse to 5 9-16d by the end of the month. October opened at 5 7-16d, hardening to 5½d, but again drooping to 5 7-16d. November it rose again to 5 9-16d, by the middle of the month to 5¾d, and by the close jumping to 6¾d in consequence of the formation of the syndicate referred to. Prices continued to advance in December, when 7¼d was paid, but lacking support and meeting with strong opposition it fell away during the month to 6¾d, and by the close to 5¾d to 6d.

The maximum of stock was on the 26th of July, 171,556 barrels, and the minimum 41,119 barrels on the 17th of May.

The total importations into London have been:

	Barrels.
1886.....	700,184
1885.....	688,616
1884.....	325,101
1883.....	714,753
1882.....	549,597
1881.....	594,972
1880.....	339,079
1879.....	388,012
1878.....	258,574
1877.....	355,914
1876.....	240,710

The present stock in Europe, as detailed below, is about:

	Barrels.
1887.....	514,367
1886.....	683,622
1885.....	1,222,267
1884.....	1,743,612
1883.....	1,518,907

	January 1, 1887.			January 1, 1886		
	Stock.	Afloat.	Load'g	Stock.	Afloat.	Load'g
London.....	98,126	10,000	37,000	98,483	70,104	51,000
Liverpool.....	50,000	30,000	20,000	45,000	30,000	-----
U.K. & for orders	30,000	30,000	50,000	30,000	10,000	8,000
Antwerp.....	98,350	40,682	27,500	51,200	71,341	40,500
Bremen.....	89,525	60,961	49,500	323,059	13,745	44,500
Hamburg.....	64,960	45,525	34,200	74,997	12,166	7,500
Rotterdam.....	34,870	39,613	14,500	27,356	12,270	22,500
Amsterdam.....	9,225	43,618	7,500	8,148	43,512	-----
Stettin.....	39,311	-----	3,500	45,373	6,973	-----

The stocks held at all the Continental Ports continue on a very reduced scale.

The total deliveries for the year show a considerable increase, which is undoubtedly due to a larger consumption of petroleum arising from improvements in lamps and the greater use for cooking and heating purposes.

RUSSIAN PETROLEUM.

The fact of the growth of this formidable competitor was quickly grasped by America, and, as the only means of dealing a blow at a dangerous rival, care has been taken to maintain a low scale of prices for American refined, and thus to reduce the profits on Russian importation. Handicapped, however, as Russia has been by heavy transport charges, expensive barrels and lack of capital, yet she has been steadily building up a trade which bids fair to be of colossal proportions. Following suit with America, she has successfully exported several bulk cargoes in tank ships to the Continent and United Kingdom, and further, has established factories for the manufacture of cases, in which already a large business has been done for the Mediterranean and Eastern ports. It is satisfactory also to notice that each fresh cargo

imported shows a marked improvement over that which preceded it. The improvement in quality is due to a great extent to the fact of the oil having been imported in tanks, thus obviating a difficulty which has previously arisen in the tendency of this oil to absorb the glue with which the inside of the barrels are lined.

IMPORTATION OF RUSSIAN PETROLEUM.

	1883.	1884.	1885.	1886.
London.....	none	12,205	18,697	200 Bbls.
Liverpool.....	502	1,973	38,230	574,000 Galls.
Bristol.....	---	---	10,347	12,000 Bbls.
Plymouth.....	---	---	1,488	13,759 Bbls.
Exeter.....	none	none	1,367	none
Hull.....	---	---	---	5,500 Bbls.
Belfast.....	---	---	---	1,749 Bbls.
	502	14,178	70,129	574,000 Galls.
	---	---	---	33,268 Bbls.

The Average Price of Crude.

The following table gives the average price of crude certificates, on the floor of the Bradford Oil Exchange, since March 1, 1879:

MONTH.	1879	1880	1881	1882	1883	1884	1885	1886	1887
January.....	110 1-5	95	83	92 3/4	111 1/4	70 3/4	88 1/4	71	---
February.....	103 1/4	89 1/4	85 1/4	101	104 3/4	73 1/4	80	---	---
March.....	86	89	82 3/4	80 3/4	97 1/4	100 3/4	80 3/4	77 1/4	---
April.....	78 3/4	76 3/4	84 3/4	78 1/4	92 3/4	91	78 3/4	74	---
May.....	73 1/2	80 1/4	81 1/2	70	99 3/4	85 1/4	79 3/4	69 3/4	---
June.....	68 3/4	100 3/4	81	54 1/2	117 1/4	68 3/4	82 1/4	67	---
July.....	69 3/4	101 3/4	76 3/4	57 3/4	108	63 1/2	96 3/4	66	---
August.....	67 3/4	103 1/4	78 3/4	58 3/4	108 3/4	81 1-5	100 3/4	62	---
September.....	69 3/4	91 1/2	92 3/4	71 1/2	112 3/4	78	100 3/4	63 3/4	---
October.....	88 3/4	96 3/4	92 3/4	93 3/4	111 3/4	71	105 1/2	65 1/2	---
November.....	105 3/4	91 1/4	82 1/4	114 3/4	114 4-5	72 1/2	104 3/4	72	---
December.....	113 1/4	92 3/4	83 3/4	95 1/4	114 3/4	74 3/4	89 3/4	71	---

The People's Gas Company, of Butler.

The attempt of the Mutual Gas Fuel Company to raise its scale of prices for Butler aroused an indignation meeting of citizens, at which it was unanimously resolved to refuse to submit to the exactions of the Mutual corporation, and to form a new company. Compared with the rates paid by Bradford, Olean and other cities of the north, the Butler schedule of rates was not exorbitant. The old company immediately called in its notices of an advance and announced that it would adhere to the old rates. Later arrangements were carried out by which the new company bought out the plant and charter of the old. The new organization is called the People's Gas Company and will have a capital stock of \$100,000.

The Refined Market.

Although the price of refined has not varied much from 6 3/4 c for 70° Abel test, the exporters have been steadily holding back for still lower quotations. They claim that in view of the present situation of the crude market and the outlook abroad, they cannot pay 6 3/4 c. Consequently sales have not been large. Ocean freights are higher, and the markets at London, Bremen and Antwerp show a steady decline.

The exports of refined, crude and naphtha, from all ports, from January 1 to January 29 have been as follows:

	1887.	1886.
	Gallons.	Gallons.
From Boston.....	508,400	325,889
Philadelphia.....	9,663,573	9,049,920
Baltimore.....	762,198	398,178
Perth Amboy.....	1,605,465	---
Total.....	12,539,636	9,800,987
From New York.....	29,768,472	30,936,765

Total exports from United States..... 42,308,108 40,737,752

Refined for the home trade continues in good demand with unchanged quotations which remain 8 1/2 @ 8 3/4 c New York State legal test, 7 3/4 @ 7 1/4 c for 110° test, 8 1/4 @ 8 1/2 c for New York city 110° flash, and 9 3/4 c for New York city 150° water white. Western lots are offered at 7 1/2 c for

110° test Standard white, 7 3/4 @ 8 c for 120° test Standard white, 8 1/2 @ 9 c for 130° test Standard white, 9 1/8 @ 9 1/4 c for Standard test and 9 3/8 @ 9 1/2 c for 150° test water white. Western naphtha 68° to 72° test is quoted at 7 1/2 @ 7 3/4 c delivered in New York. The demand for refined in cases has been very small, with quotations of 8 1/2 to 9 3/4 c., according to brand.

REFINED QUOTATIONS FOR JANUARY.

	New York	Philadelphia	Baltimore	London and Liverpool	Bremen	Antwerp
	Cts.	Cts.	Cts.	Pence.	Marks.	Francs.
1 Holiday.....	---	---	---	---	---	---
2.....	6 1/2	6 1/2	6 1/2	6 1/2	6.80	17 1/2
3.....	6 1/2	6 1/2	6 1/2	6 1/2	6.80	17 1/2
4.....	6 1/2	6 1/2	6 1/2	6 1/2	6.70	17 1/2
5.....	6 1/2	6 1/2	6 1/2	6 1/2	6.70	17 1/2
6.....	6 1/2	6 1/2	6 1/2	6 1/2	6.65	17 1/2
7.....	6 1/2	6 1/2	6 1/2	6 1/2	6.65	17 1/2
8.....	6 1/2	6 1/2	6 1/2	6 1/2	6.65	17 1/2
9.....	6 1/2	6 1/2	6 1/2	6 1/2	6.60	17 1/2
10.....	6 1/2	6 1/2	6 1/2	6 1/2	6.60	17 1/2
11.....	6 1/2	6 1/2	6 1/2	6 1/2	6.60	17 1/2
12.....	6 1/2	6 1/2	6 1/2	6 1/2	6.60	17 1/2
13.....	6 1/2	6 1/2	6 1/2	6 1/2	6.60	17 1/2
14.....	6 1/2	6 1/2	6 1/2	6 1/2	6.50	17 1/2
15.....	6 1/2	6 1/2	6 1/2	6 1/2	6.50	17 1/2
16.....	6 1/2	6 1/2	6 1/2	6 1/2	6.60	17 1/2
17.....	6 1/2	6 1/2	6 1/2	6 1/2	6.70	17 1/2
18.....	6 1/2	6 1/2	6 1/2	6 1/2	6.40	17 1/2
19.....	6 1/2	6 1/2	6 1/2	6 1/2	6.55	17 1/2
20.....	6 1/2	6 1/2	6 1/2	6 1/2	6.50	17 1/2
21.....	6 1/2	6 1/2	6 1/2	6 1/2	6.45	17 1/2
22.....	6 1/2	6 1/2	6 1/2	6 1/2	6.45	17 1/2
23.....	6 1/2	6 1/2	6 1/2	6 1/2	6.45	17 1/2
24.....	6 1/2	6 1/2	6 1/2	6 1/2	6.45	17 1/2
25.....	6 1/2	6 1/2	6 1/2	6 1/2	6.45	17 1/2
26.....	6 1/2	6 1/2	6 1/2	6 1/2	6.45	17 1/2
27.....	6 1/2	6 1/2	6 1/2	6 1/2	6.45	17 1/2
28.....	6 1/2	6 1/2	6 1/2	6 1/2	6.45	17 1/2
29.....	6 1/2	6 1/2	6 1/2	6 1/2	6.35	17 1/2
30.....	6 1/2	6 1/2	6 1/2	6 1/2	6.35	17 1/2
31.....	6 1/2	6 1/2	6 1/2	6 1/2	6.35	17 1/2

FIELD OPERATIONS SUMMARIZED.

WELLS COMPLETED, WITH THE ESTIMATED PRODUCTION ON THE LAST DAY OF THE MONTH.

ALLEGANY FIELD.

Division of Field.	JANUARY, 1887.			DECEMBER, 1886.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Scio.....	0	0	0	0	0	0
Alma.....	1	4	0	1	4	0
Wirt.....	2	6	0	2	13	0
Bolivar.....	0	0	0	1	5	0
Clarksville.....	1	15	0	3	21	0
Genesee.....	0	0	0	0	0	0
Miscellaneous.....	0	0	0	0	0	0
Total.....	4	25	0	7	43	0

BRADFORD FIELD.

Division of Field.	JANUARY, 1887.			DECEMBER, 1886.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
E. and W. Branches.....	6	27	1	4	27	0
Kendall Creek.....	0	0	0	0	0	0
Foster Brook.....	2	15	0	1	10	0
Knapp's Creek.....	1	0	1	3	11	1
Four Mile.....	0	0	0	0	0	0
Indian & Meeks Creeks.....	4	30	0	4	32	0
Cole Creek.....	0	0	0	1	20	0
Kinzua.....	1	5	0	1	10	0
Miscellaneous.....	1	0	1	3	0	3
Total.....	15	77	3	17	110	4

WARREN AND FOREST.

District.	JANUARY, 1887.			DECEMBER, 1886.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Glade.....	5	75	2	10	81	2
Clarendon.....	9	31	2	6	34	0
Tiona.....	8	42	0	6	36	0
Cooper.....	0	0	0	0	0	0
Balltown.....	0	0	0	2	15	1
Kane.....	3	30	0	7	68	1
Grand Valley.....	7	49	0	14	118	1
Miscellaneous.....	7	33	3	10	10	8
Total.....	39	260	7	55	362	13

LOWER COUNTRY.

District.	JANUARY, 1887.			DECEMBER, 1886.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Venango.....	32	189	13	36	133	17
Clarion.....	8	55	2	7	22	3
Butler and Armstrong.....	27	921	5	32	981	5
Washington.....	14	1887	3	19	1880	5
Shoustown, Etc.....	20	293	4	16	595	5
Total.....	101	3345	27	110	3611	35

GRAND SUMMARY.

District.	JANUARY, 1887.			DECEMBER, 1886.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Allegheny.....	4	25	0	7	43	0
Bradford.....	15	77	3	17	110	4
Warren and Forest.....	39	260	7	55	362	13
Lower Field.....	101	3345	27	110	3611	35
Total January.....	159	3707	37	139	4126	52
Total December.....	189	4126	52			
Difference.....	30	419	15			

Rigs Up and Building—Wells Drilling.

ALLEGANY FIELD.

Division of Field.	JAN. 31, 1887.				DEC. 31, 1886.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Scio.....	0	4	0	4	0	4	0	4
Alma.....	0	5	0	5	1	1	1	3
Wirt.....	0	10	2	12	1	12	2	15
Bolivar.....	0	2	0	2	0	2	0	2
Genesee.....	0	3	0	3	0	3	0	3
Clarksville.....	4	5	2	11	2	5	1	8
Miscellaneous.....	0	0	2	2	0	0	1	1
Total.....	5	34	6	45	4	36	5	45

BRADFORD FIELD.

Division of Field.	JAN. 31, 1887.				DEC. 31, 1886.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
E. and W. Branches.....	1	10	6	17	2	10	7	19
Kendall Creek.....	0	0	0	0	0	0	0	0
Knapp's Creek.....	3	7	2	12	1	9	2	11
Foster Brook.....	1	4	1	6	1	4	2	7
Four Mile.....	0	3	0	3	0	3	0	3
Indian Creek.....	2	4	3	9	2	5	5	12
Cole Creek.....	1	4	1	6	2	4	0	6
Kinzua.....	1	0	1	2	0	0	1	1
Miscellaneous.....	0	0	0	0	0	0	2	2
Total.....	9	32	14	55	8	34	19	61

WARREN AND FOREST.

Division of Field.	JAN. 31, 1887.				DEC. 31, 1886.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Glade.....	1	0	5	6	2	0	3	5
Clarendon.....	1	4	2	7	2	4	11	17
Tiona.....	0	5	2	7	0	4	3	7
Cooper.....	0	1	1	2	0	0	0	0
Balltown.....	1	2	2	5	0	3	2	5
Kane.....	1	2	6	9	3	3	6	12
Grand Valley.....	2	3	5	10	2	2	6	10
Miscellaneous.....	1	4	2	7	1	4	7	12
Total.....	21	23	30	74	13	25	38	76

LOWER COUNTRY.

Division of Field.	JAN. 31, 1887.				DEC. 31, 1886.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Venango.....	15	10	25	50	12	10	27	49
Clarion.....	7	8	8	23	3	8	10	20
Butler & Armstrong.....	29	7	45	81	20	2	45	67
Washington.....	6	7	51	64	9	10	60	79
Shoustown, Etc.....	6	3	17	26	6	8	35	49
Total.....	43	35	146	224	49	38	177	264

GRAND SUMMARY.

Field.	JAN. 31, 1887.				DEC. 31, 1886.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Allegheny.....	5	34	6	45	4	36	5	45
Bradford.....	9	32	14	55	8	34	19	61
Warren and Forest.....	21	23	30	74	13	25	38	76
Lower Country.....	43	35	146	224	49	38	177	264
Total.....	78	124	196	398	74	133	239	446
Total Dec. 31.....	74	133	239	446				
Difference.....	4	9	43	48				

PENNSYLVANIA NATURAL GAS COMPANIES.

THE natural gas companies of Pennsylvania represent a capital of about \$28,500,000, which is constantly increasing, by the incorporation of new companies and the augmentation of the amount of the capital of those in existence. Since the passage of the act of 1885, authorizing the formation of natural gas companies, sixty-seven have been chartered and twenty-nine concerns, previously organized, have accepted the provisions of the law. Following is a list of the companies organized under the Natural Gas Act, with names of principal stockholders:

Peoples, Allegheny county, Pittsburgh. Capital stock, \$1,000,000. E. O. Emerson, J. N. Pew, Theodore Johnston, Robert C. Pew, T. F. Robinson, R. S. Duffield.

Franklin, Venango county, Franklin. Capital stock, \$100,000. Chas. W. Mackey, Wm. J. Welsh, Benj. W. Bredin, Wm. H. Forbes, Jas. W. Rowland.

Canonsburg L. and F. Co., Washington. Capital stock, \$20,000. C. Meyran, Samuel Munell, John F. Budke, Wm. Paxton.

Manufacturers, Allegheny county, Pittsburgh. Capital stock, \$300,000. Charles Meyran, W. J. Lewis, M. K. Morehead, Henry Lloyd, Henry Fisher, Fred Fisher and ten others.

Shenango, Lawrence county, New Castle. Capital stock, \$350,000. Henry Fisher, Andrew W. Mellon, Jos. W. Craig, H. E. Picket, J. H. Galey, J. C. Fisher.

Dunlap, Fayette county, Brownsville. Capital stock, \$18,000. Thomas Aubrey, A. B. Bowman, E. C. Crumrine, W. S. Duncan.

Ridgway, Elk county, Ridgway. Capital stock, \$100,000. Alfred Short, W. C. Healey, Dyson Rishell.

Meadville, Crawford county, Meadville and adjacent. Capital stock, \$100,000. Samuel B. Dick, Jas. D. Gill, W. S. Harper, John Potter, Wm. Reynolds.

Uniontown, Fayette county, Uniontown. Capital stock, \$30,000. Charles E. Boyle, John K. Ewing, J. M. Thompson.

Harrison, Allegheny county, Tarentum. Capital stock, \$2,500. David Challinor, L. H. Hartley, Jas. D. Wilson.

People's Natural Gas and Pipeage, Allegheny county, Pittsburgh. Capital stock, \$100,000. Jas. Irwin, D. B. Oliver, J. H. Wright.

Independent, Allegheny county, Allegheny. Capital stock, \$50,000. H. H. Byram, Chas. L. Caldwell, M. A. Verner.

Scottdale, Westmoreland county, Scottdale. Capital stock, \$5,000. P. S. Laucks, N. Miles, C. L. Graff.

Ohio Valley, Allegheny county, Sewickley. Capital stock, \$100,000. Wm. L. Standish, J. K. Fleming, L. Halsey Williams.

Columbia, Venango county, Franklin. Capital stock, \$1,000,000. R. E. Townsend, M. Murphy, D. Grimm, C. W. Mackey.

North East, Erie county, North East. Capital stock, \$5,000. A. Short, E. K. Nason, D. R. Cushman.

Sharpsville, Mercer county, Sharpsville. Capital stock, \$5,000. J. H. Twitmyer, T. O. Hazen, A. A. Reichard.

Sharon, Mercer county, Sharon. Capital stock, \$5,000. E. A. Wheeler, Alex. McDowell, Thos. Tanner.

Meadville, Crawford county, Meadville. Capital stock, \$100,000. Daniel O'Day, Wm. T. Scheide, Joseph Seep, E. Strong, Lewis Walker, G. W. Delamater, Jas. E. McFarland.

Baden, Allegheny county, Pittsburgh. Capital stock, \$500,000. J. Sharp McDonald, W. S. B. Hays, G. J. Grammer.

The Consumers, Armstrong county, Kittanning. Capital stock, \$10,000. F. E. Patterson, R. L. Brown, F. P. Wolf.

Mahoning, Lawrence county, New Castle. Capital stock, \$250,000. Robert McCurdy, Thomas H. Wells, H. O. Bonnell.

United Gas, Allegheny county, Pittsburgh. Capital stock, \$10,000. Edwin H. Smith, Charles M. Corbit, Robert Cleghorn.

Westmoreland and Cambria, Westmoreland and Allegheny counties, Pittsburgh. Capital, \$2,000,000. Wm. H. DeWald, H. Darlington, James M. Guffey, W. S. Guffey, Walter S. Mitchell.

Carneige, Allegheny county, Pittsburgh. Capital stock, \$300,000. Wilson Miller, Wm. J. McKinney, F. T. F. Lovejoy.

Pennsylvania, Pittsburgh, Philadelphia. Capital stock, \$1,000,000. John Donaldson, J. H. Henderson, David B. Duncan, J. W. Tuckerman.

Phillipsburg, Beaver county, Phillipsburg. Capital stock, \$60,000. W. J. Miller, Andrew Howard, E. P. Ebberts, Edward Kaye.

Royal, Washington county, Washington. Capital stock, \$525,000. Wm. P. Logan, John S. Newbold, John Lowber Welsh.

Torrens, Allegheny county, Pittsburgh. Capital stock, \$25,000. Finley Torrens, George Laing, James Williams, Thomas G. Hood.

Western Pennsylvania, Pittsburgh. Capital stock, \$5,000. Wm. Flinn, J. M. Guffey, L. H. Williams.

Suburban, Allegheny county, Pittsburgh. Capital stock, \$100,000. James J. Buchanan, W. H. Latshaw, James Bishop.

New Bethlehem, Clarion county, New Bethlehem. Capital stock, \$50,000. J. R. Foster, F. S. Andrews, Charles O'Donnell.

Pine Run, Armstrong county, Pittsburgh. Capital stock, \$200,000. E. M. Hukill, Geo. P. Hukill, George R. Stewart.

Greensburg Fuel, Westmoreland county, Greensburg. Capital stock, \$80,000. James Armstrong, Stark Bros., James C. Clarke, R. Coulter.

Union Light and Heat, Clarion county, Foxburg. Capital stock, \$15,000. J. W. Rowland, E. M. Grant, Eben Crawford.

Elk, Elk county, Ridgway. Capital stock, \$50,000. John G. Hall, W. H. Hyde, W. H. Osterhout.

Renovo Gas and Oil Co., Clinton county, Renovo. Capital stock, \$6,000. P. H. Sullivan, John Kane, W. L. Holman.

Bellevue, Allegheny county, Pittsburgh. Capital stock, \$50,000. J. M. Guffey, W. S. Mitchell, George H. Dimmick.

Sewickley, Allegheny county, Sewickley. Capital stock, \$10,000. D. C. Herbst, Wm. Stanton, J. M. Hall.

Home, Fayette county, Brownsville. Capital stock, \$5,000. E. C. Schmertz, P. Hamburger, Wm. H. Miller.

Lawrence, Oil City. Capital stock, \$1,000,000. Daniel O'Day, Wm. T. Scheide, C. N. Payne.

Grapeville, Westmoreland county, Pittsburgh. Capital stock, \$100,000. H. J. Brunot, George F. Huff, R. Coulter.

Mercer, Mercer county, Mercer. Capital stock, \$12,500. John I. Gordon, S. H. Miller, B. Magoffin.

North Side, Allegheny county, Pittsburgh. Capital stock, \$96,000. W. E. Schmertz, W. H. Singer, James A. Chambers.

Independent, Allegheny county, Sewickley. Capital stock, \$40,000. J. McCleave, J. M. Hall, H. Holdship.

Union, Venango county, Franklin. Capital stock, \$30,000. E. G. Crawford, M. J. McDowell, W. J. Bleakley.

Greenville, Mercer county, Greenville. Capital stock, \$50,000. P. L. Kimberly, J. R. Packard, E. S. Templeton.

Low Pressure, Allegheny county, Pittsburgh. Capital stock, \$50,000. J. H. Danks, J. D. McCabe, Wm. Coffey.

Kansas, McKean county, Duke Centre. Capital stock, \$5,000. L. Suhr, J. C. Gilbert, A. J. Gilbert.

National, Allegheny county, Pittsburgh. Capital stock, \$10,000. O. P. Scaife, W. G. Park, W. McCandless.

Bellewood and Monongahela City, Washington county, Monongahela. Capital stock, \$10,000. R. E. Byers, R. R. Abrams, A. D. Scott.

Bellevue L. and H. Co., Fayette county, Bellevue. Capital stock, \$10,000. R. E. Schmertz, Thomas C. Daly, R. J. Linton.

Connellsville G. and H. Co., Fayette county, Connellsville. Capital stock, \$5,000. L. Johnston, A. Bishop, Robert Norris.

Citizens' L. and H., Bradford. Capital stock, \$10,000. W. H. D. Chapin, F. R. Hilton, E. E. Tait.

Chicopee, Pittsburgh, Pa. Capital stock, \$250,000. R. P. Crafts, J. A. Knapp, E. Gaylord.

Elizabeth, Pittsburgh. Capital stock, \$15,000. R. M. Boyd, J. A. McClure, George Laing.

Keystone, Armstrong county, Parker City. Capital stock, \$10,000. A. C. Beeson, E. A. Beeson, W. S. Gebhart.

Manufacturers', Oil City. Capital stock, \$150,000. John B. Smithman, A. D. Deming, W. J. Innis.

Northwestern, Corry, Pa. Capital stock, \$20,000. J. B. Davis, Fred Stanford, F. E. Mulkie.

Northwestern Pennsylvania Natural Gas Co., Oil City. Capital stock, \$500,000. D. O'Day, W. T. Scheide, Jos. Seep.

People's, Warren, Pa. Capital stock, \$1,000. S. D. Davis, H. A. Jamieson, O. W. Beatty.

Southern, Washington, Pa. Capital stock, \$100,000. C. W. Bachelor, Henry Fisher, J. J. Vandergrift.

Tionesta, Tionesta. Capital stock, \$50,000. D. W. Clark, E. L. Davis, C. H. Tew.

United Natural, Oil City. Capital stock, \$2,500,000. National Transit Co., B. Brewster, D. O'Day.

Philadelphia, Pittsburgh. Capital stock, \$7,500,000. Geo. Westinghouse, President.

Manufacturers', McKean county, Bradford. Capital stock, \$50,000. D. Bovaird, J. L. Seyfang, T. N. Barnsdall, John Markham, James Broder.

National, Allegheny. Capital stock, \$10,000. O. P. Scaife, Wm. G. Park, W. McCandless.

The following have accepted the provisions of the act of 1885:

Sharon Gas Co., Mercer county, Sharon.....	\$ 20,000
Butler Gas Co., Butler.....	100,000
Brookville, Brookville, Pa.....	3,000
National Transportation Co., McKeesport.....	10,000
Mutual Gas Fuel Co., Butler.....	20,000
Mahoning, Punxsutawney, Pa.....	100,000
Sheffield, Sheffield, Pa.....	10,000
Washington, Pittsburgh.....	500,000
Acme Fuel, Pittsburgh.....	3,500
Gas Fuel, Erie.....	15,000
Clarion, of Clarion.....	18,000
Smethport, of Smethport.....	5,000
Kane, of Kane.....	10,000
Carpenter, Pittsburgh.....	10,000
People's, Washington.....	25,000
Union, McKeesport.....	30,000
Fuel Gas, Allegheny.....	10,000
Penn Fuel, Pittsburgh.....	10,000
Franklin, Hydro-Carbon.....	50,000
Pennsylvania, Warren.....	2,000,000
Oil City Fuel Supply.....	1,000,000
Acme, Pittsburgh.....	10,000
Braddock Fuel.....	3,500
Allegheny Heating.....	500,000
Bridgewater, Beaver.....	700,000
Emlenton.....	20,000
Kittanning.....	60,000
Chartiers.....	2,500,000
Kittanning, Caloric.....	30,000

Stocks Abroad.

Reports of stocks in London, Trieste, and the seven principal Continental ports, are summarized in the following statement:

STOCKS AFLOAT AND ASHORE.	Jan. 15, 1887.	Dec. 24, 1886.
Barrels.	Barrels.	Barrels.
Seven Continental Ports.....	740,402	748,092
London.....	180,048	165,239
Trieste.....	-----	-----
Total Stocks afloat and ashore	920,450	913,331
Increase in stocks since Dec. 24.....	7,119	-----

A detailed statistical table giving the stocks on hand, the stocks in vessels on the ocean, and the amount unloading from the vessels at the different ports, is appended, which shows at a glance the condition of affairs abroad and the increase or decrease as compared with the corresponding period of 1886. The shipments represent the amount of oil going to the interior of Europe from the seaports:

STOCKS IN FOREIGN PORTS JANUARY 15, 1887.

PORTS.	Stocks week ending Jan. 15.		Stocks afloat week ending Jan. 15.		Loading. Week ending Jan. 15.		Grand total stocks afloat and loading.		Receipts From July 1.		Shipments from July 1.	
	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.
London	131,626	85,398	44,000	42,950	23,000	51,700	198,626	180,048	413,673	341,086	389,034	430,438
Bremen.....	233,619	113,322	60,074	96,337	15,000	37,000	308,693	246,659	329,271	361,026	534,722	459,080
Hamburg	87,689	33,026	34,232	57,445	18,800	32,200	90,721	122,671	590,273	582,336	733,426	704,175
Antwerp	32,757	66,551	71,035	25,638	48,400	79,106	152,92	171,289	529,625	517,295	608,285	611,445
Rotterdam	24,798	45,833	27,734	5,196	13,300	17,500	66,332	68,079	245,907	367,381	290,046	403,937
Amsterdam	23,572	35,822	18,618	9,046	33,000	14,500	75,190	59,868	139,932	164,007	143,781	195,663
Stettin.....	31,295	29,758	9,059	-----	-----	3,000	40,354	32,758	218,148	28,135	245,265	266,170
Danzig	21,918	31,135	-----	8,443	-----	-----	21,918	39,578	58,858	51,945	51,573	53,057
Total	405,648	354,997	220,752	202,105	129,000	183,300	755,400	740,402	2,103,064	2,327,125	2,607,098	2,693,527
Total stocks Continental Ports	-----	-----	-----	-----	-----	-----	-----	-----	1884. 1,203,035	1885. 895,059	1886. 405,648	1887. 354,997
Total afloat,	-----	-----	-----	-----	-----	-----	-----	-----	158,123	134,167	220,752	202,105
Total loading	-----	-----	-----	-----	-----	-----	-----	-----	148,700	84,000	129,000	183,300
Total	-----	-----	-----	-----	-----	-----	-----	-----	1,509,858	1,113,226	755,400	740,402
Afloat and loading for direct Continental Ports	-----	-----	-----	-----	-----	-----	-----	-----	-----	1,000	-----	-----
“ “ “ Baltic Sea, exclusive Stettin and Danzig	-----	-----	-----	-----	-----	-----	-----	-----	-----	2,500	8,000	18,000
“ “ “ Total Continental Ports	-----	-----	-----	-----	-----	-----	-----	-----	1,508,858	1,116,726	763,400	753,402
“ “ “ Total London	-----	-----	-----	-----	-----	-----	-----	-----	398,916	143,116	198,626	180,048
“ “ “ English harbors, exclusive London	-----	-----	-----	-----	-----	-----	-----	-----	88,300	32,000	51,500	130,700
Grand total	-----	-----	-----	-----	-----	-----	-----	-----	1,997,074	1,291,842	1,013,526	1,064,150

OFFICIAL STATEMENT—EXPORTS OF PETROLEUM, DECEMBER, 1886.

BY WM. F. SWITZLER, CHIEF OF BUREAU OF STATISTICS, WASHINGTON, D. C., JANUARY 10, 1887.

CUSTOMS DISTRICTS	MINER'L, CRUDE		NAPHTHAS		ILLUMINATING.		LUBRICATING & PARAFFINE OILS.		RESIDUUM.		TOTAL.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Boston and Charles-town, Mass.....	-----	-----	2,463	700	476,626	47,328	18,455	3,796	-----	-----	497,544	51,824
New York, N. Y.....	3,814,435	222,826	847,459	75,357	25,731,000	2,042,610	1,289,028	255,325	4,116	365	31,186,088	2,596,485
Philadelphia, Pa.....	2,989,170	174,688	339,866	27,826	7,958,539	640,843	30,130	4,215	-----	-----	11,317,705	847,572
Baltimore, Md.....	-----	-----	-----	-----	1,301,052	89,152	83,515	6,928	-----	-----	1,384,567	96,080
Total for Dec., 1886..	6,303,655	397,514	1,189,888	103,885	35,467,217	2,819,933	1,421,128	270,264	4,116	365	44,385,904	3,591,961
Total for D. c., 1885.	5,929,849	436,905	556,670	50,183	36,914,043	3,371,447	1,370,903	276,645	212,310	12,506	44,983,775	4,147,686
Total for 12 months ending Dec. 31, 1886.	76,337,760	5,067,373	14,306,927	1,243,516	473,284,984	37,959,245	18,749,812	2,636,973	1,993,858	109,668	579,673,341	47,016,775
Total for 12 months ending Dec. 31, 1885.	81,229,072	6,025,105	14,589,624	1,133,769	453,841,438	39,168,610	12,699,533	2,583,105	5,726,952	334,170	568,086,619	49,244,759

CRUDE QUOTATIONS FOR JANUARY, 1887.

Day of Month and week.	BRADFORD.				OIL CITY.				NEW YORK.				PITTSBURGH.			
	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed
S 1 Holiday.	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
M 3.....	70	71½	70	70½	70	71½	70	70½	70½	71½	70½	70½	70½	71½	70½	70½
T 4.....	70½	71½	69½	69½	71½	71½	69½	69½	70½	71½	69½	69½	70½	71½	69½	69½
W 5.....	70	71½	69½	70½	70	71½	69½	70½	70	71	69½	70½	69½	70½	69½	70½
T 6.....	70½	72	70½	71½	71½	72	70½	71½	70½	71½	70½	71½	70½	71½	70½	71½
F 7.....	71½	71½	70½	71	71½	72½	70½	70½	71½	72½	70½	70½	71½	72½	70½	71
S 8.....	71½	71½	70½	71	71½	71½	70½	71	71½	71½	70½	71	71½	71½	70½	71
M 10.....	71½	71½	71½	71½	71½	71½	71½	71½	71½	71½	71½	71½	71½	71½	71½	71½
T 11.....	71½	72½	71½	71½	72	72½	71½	72	71½	72½	71½	71½	72	72½	71½	72
W 12.....	72	72	71	71½	72	72½	71	71½	72	72	71½	71½	72½	72½	71½	71½
T 13.....	72	72	71½	71½	71½	71½	71	71½	71½	72	71	71½	71½	71½	71	71½
F 14.....	71½	71½	68	70½	71½	71½	67½	70½	71½	71½	68½	70½	71½	71½	68	70½
S 15.....	70½	71½	70½	70½	70½	71½	70½	70½	70½	71½	70	70½	70½	71½	70	71
M 17.....	70½	72	70½	71½	70½	72	70½	71½	71	72½	70½	71½	71	72	71	71½
T 18.....	71½	72½	71½	71½	71½	72½	71½	71½	71½	72½	71½	72	71½	72½	71½	71½
W 19.....	72	72½	71½	72½	72½	72½	71½	71½	72½	72½	71½	72½	72½	72½	71½	72½
T 20.....	72	72	71½	71½	72½	72½	71½	71½	72	72	71½	71½	72½	72½	71½	71½
F 21.....	71½	71½	70½	71½	71½	71½	71	71½	71	71½	70½	71½	71½	71½	70½	71½
S 22.....	71½	71½	70	71½	71	71½	71	71	71½	71½	71	71½	71½	71½	71	71½
M 24.....	71½	71½	70½	70½	71½	71½	70½	70½	71	71½	70½	70½	71½	71½	70½	70½
T 25.....	70½	70½	69½	69½	70½	70½	69½	69½	70½	70½	69½	69½	70½	70½	69½	69½
W 26.....	70	70½	69½	70½	70½	70½	69½	70½	69½	70½	69½	70½	69½	70½	69½	70½
T 27.....	70½	70½	70½	70½	70½	70½	70½	70½	70½	70½	70½	70½	70½	70½	70½	70½
F 28.....	70	70½	69½	69½	70½	70½	70	70	70½	70½	69½	70	70	70½	70	70
S 29.....	70	70½	70	70½	70½	70½	70½	70½	70½	70½	70	70½	70	70½	70	70½
Difference	70½	70½	69½	69½	70	70½	69½	69½	70	70½	69½	69½	70	70½	69½	69½

THE PETROLEUM AGE,

DEVOTED TO THE
INTERESTS OF THE PETROLEUM TRADE.

PUBLISHED MONTHLY BY

McMULLEN, SNELL & ARMOR,
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THE BILLINGSLEY BILL.

NO measure of recent time has excited more discussion and received more attention from producers and pipe line men, than the bill before the Legislature, introduced by Mr. Billingsley, of Washington, on January 27th, and known as House Bill No. 104. Stripped of all technical phraseology the measure aims at a reduction of pipe line charges for pipeage and storage, and of the percentage taken for sediment and surplus. While the present measure doubtless contains some objectionable and impracticable features, the motive of it is endorsed by the oil producer and the general oil trade. The average cost of production has been cheapened considerably during the past three years, and the average price of crude has ranged at an exceedingly low level, but there has been no corresponding reduction in the price of storing and transporting petroleum. And while the producer has been compelled to conduct his business at a very small margin of profit, the profits of the pipe lines have been practically greater than ever before.

The Billingsley bill provides that the present 3 per cent. for wastage, evaporation, etc., be reduced to one-half of 1 per cent., that pipeage charges shall not exceed 10 cents per barrel, and that storage charges shall be reduced to 16 $\frac{2}{3}$ cents a day, per thousand barrels. While these figures are comparatively very small they would probably enable the present lines to conduct business at a small profit, but would act as a preventive to the establishment of new lines in new fields. But to obviate this difficulty, a remarkable section is inserted, which compels a pipe line to lay pipes to any farm in the Commonwealth of Pennsylvania, wherever the wild-catter succeeds in striking oil no matter how remote the location or how small the calibre of the well.

Meetings have been held in the principal cities of the oil regions to discuss this measure, and while there is considerable diversity of ideas in regard to the practical working of the bill, the opinion among producers is that the charges of the pipe lines are exorbitant and should be reduced. Considerable acrimony has been aroused at these meetings, but the general result will probably be the passage of the act with such amendments as will give the pipe lines a margin of profit sufficient to induce them to continue the business.

Following is the full text of the bill:

An act to punish corporations, companies, firms, associations and persons, and each of them engaged in business of transporting by pipe line or lines or storing petroleum in tank or tanks, under certain restrictions and penalties, from charging in excess of certain fixed rates for receiving, transporting, storing and delivering petroleum, and to regulate deductions for losses caused

to petroleum in pipe lines and storage tanks by lightning, fire, storm or other unavoidable causes.

SECTION 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania in general assembly met, and it is hereby enacted by authority of the same: That no corporation, company, firm, association, person or persons, who are now, or shall hereafter, engage in the business of transporting or storing crude or refined petroleum by means of pipe line or pipe lines, or storage by tank or tanks, shall demand or receive any rate of charge in excess of 10 cents per barrel, reckoning forty-two gallons for each barrel, for all services performed within this Commonwealth in receiving petroleum from tank or tanks or other receptacle on the lease or farm at the place of its production and transporting and delivering the same, or petroleum of like kind and quality in every essential particular in the division of such pipe line within which the same shall have been received at any shipping point in said division which may be designated by the holder, owner or purchaser of said petroleum, whether said petroleum is held by certificate, voucher, receipt, credit balance, accepted order, or otherwise. And such corporation, company, firm, association, person or persons, and each of them, are hereby required immediately upon this act becoming a law, to erect and establish, if not already established, and maintain thereafter at least one shipping point within each pipe line division within this Commonwealth, of sufficient dimensions, capacity and equipment to accommodate the entire trade within each such pipe line division.

SECTION 2. No such corporation, company, firm, association, person or persons, shall demand or receive from any person or persons, firms, association, company or corporation owning or holding a credit balance for petroleum in line or tank within this Commonwealth any rate of charge whatever for the tankage or storage of petroleum owned or so held by credit balance for the first thirty days from the date of said credit balance. And no corporation, company, firm, association, person or persons, who are now engaged or shall hereafter engage in the business of transporting or storing crude or refined petroleum by means of pipe line or pipe lines, or storage tank or tanks, shall demand or receive, from any source whatsoever, for the tankage of crude or refined petroleum within this Commonwealth, any rate of charge in excess of one-sixtieth of one cent per barrel of forty-two gallons a day or fractional part thereof so long as said petroleum shall thereafter be held and stored in tank.

SECTION 3. Such corporation, company, firm, association, person or persons are hereby obliged and required, and it is hereby made the duty of such corporation, company, firm, association, person or persons, and each of them, to hold and store in tank any and all petroleum offered for storage or transportation or any and all petroleum received and transported by them, or either of them for the owner thereof; or for the person or persons holding certificate, voucher, receipt, credit balance or accepted order therefor, for a period of one year or for any shorter period than one year from the time when said petroleum was first received by such corporation, company, firm, association, person or persons, for storage, if requested so to do by the owner thereof, or by the person or persons holding certificate, voucher, receipt, credit balance or accepted order therefor, at and for the rate of charge of one-sixtieth of one cent per barrel of forty-two gallons for each day, or fractional part thereof thereafter. Except that when said petro-

leum is held by credit balance, no rate of charge whatever shall be made or charged on said credit balance for the first thirty days from the date of said credit balance.

SECTION 4. Such corporation, company, firm, association, person or persons shall be allowed to make a deduction from the crude petroleum received, transported or stored, not to exceed one-half of one percentum of said petroleum so received, transported or stored, on account of water, sediment, evaporation, waste and the like. The deduction mentioned in this section shall be made when the petroleum is first run or transported by such corporation, company, firm, association, person or persons, from the tank or receptacle on the lease or farm where produced, and it is hereby declared to be unlawful for such corporation, company, firm, association, person or persons to make the reduction in this section provided for at any other time or place than as above provided.

SECTION 5. Any corporation, company, firm, association, officer or officers, agent or agents, person or persons, engaged in the business of transporting or storing crude or refined petroleum within this Commonwealth by means of pipe line or pipe lines, or storage tank or tanks shall, upon application of the owner of any well or wells, lay pipe or pipes to any well or wells, on any lease or leases, in any locality where there is any oil on any farm or farms in this Commonwealth, and receive the oil therefrom and transport the same through their pipe line or pipe lines and store the same in their storage tank or tanks, in any place in any division designated by the owner or purchaser of said petroleum, and hold the same subject to the owner or purchaser at the rate or charge prescribed in the preceding sections.

SECTION 6. Such corporation, company, firm, association, person or persons shall be liable for all loss caused by lightning, fire, storm or other unavoidable cause to the petroleum received, transported or stored by them, and in the event of any such loss the same shall be charged by said corporation, company, firm, association, person or persons, pro rata, upon and deducted from all petroleum in the custody of such corporation, company, firm, association, person or persons at the date of such loss.

SECTION 7. Any corporation, company, firm, association, officer or officers, agent or agents thereof, person or persons engaged in the business of transporting or storing crude or refined petroleum within this Commonwealth by means of pipe line or pipe lines or storage tank or tanks, who shall demand or receive any rate of charge in excess of 10 cents per barrel, reckoning forty-two gallons for each barrel, for all services performed within this Commonwealth for receiving petroleum from tank or tanks or other receptacle on the lease or farm at the place of its production and transporting and delivering the same or petroleum of like kind and quality in every essential particular in the division of the pipe line within which the same shall have been received at the shipping point designated by the holder, owner or purchaser of said petroleum, or who shall fail or neglect to erect and establish immediately upon this act becoming a law—if not already established—and maintain thereafter at least one shipping point within each pipe line division within this Commonwealth, of sufficient dimension and capacity, and properly equip the same to accommodate the entire trade within each such district, or who shall demand or receive for the storage of petroleum within this Commonwealth, any rate of charge in excess of one-sixtieth of one cent a barrel of forty-two gallons a day or a fractional part thereof, so long as said

petroleum shall thereafter be held and stored in tank, or who shall demand or receive from any person or persons, firm, association, company or corporation owning or holding a credit balance for petroleum so owned or held by credit balance for the first thirty days commencing from the date of said credit balance, or who shall refuse to hold and store in tank any and all petroleum received and transported by them or either of them for the owner thereof, or for the person or persons holding certificate, voucher, receipt, credit balance or accepted order therefor for the period of one year from the time when said petroleum was first received by such corporation, company, firm, association, person or persons, for storage, if requested so to do by the owner thereof, or by the person or persons holding certificate, voucher, receipt, credit balance or accepted order therefor, at and for the rate of charge of one-sixtieth of one cent per barrel of forty-two gallons for each day or fractional part thereof thereafter—but no rate of charges whatever shall be had, or made, for the first thirty days from date of credit balance, when oil is held by credit balance—or who shall make any deduction on account of water, sediment, evaporation, waste or the like, in excess of one-half of 1 per cent. of the petroleum received, transported and stored, or who shall violate any or either of the provisions or requirements of any or either of the first sections of this act, shall be deemed guilty of a misdemeanor and on conviction thereof shall be sentenced to pay a fine of not less than one thousand dollars nor more than two thousand dollars for the first offense, and for the second and any subsequent offense to pay a fine of not less than two thousand dollars nor more than five thousand dollars and to undergo an imprisonment of not less than sixty days and not exceeding one year, one-half of any such fine or fines to be paid to the prosecutor and the other one-half to be for the use of the county in which such offense or offenses shall have been committed, and in addition to the penalties hereinbefore provided shall be liable in an action of debt to any person or persons, firm, company, association or corporation thereby aggrieved for double the amount of the damage sustained by reason of the violation of any of the provisions of this act.

SECTION 8. No contract heretofore made or now existing, for receiving, transporting or storing petroleum within this Commonwealth shall be in any manner impaired or affected by the provisions of this act.

SECTION 9. All acts and parts of acts inconsistent herewith are hereby repealed.

SECTION 10. This act shall take effect immediately upon its becoming a law.

MR. R. W. CRISWELL, late managing editor of the Cincinnati *Enquirer*, author of the "Grandfather Lickshingle Sketches" and an old time newspaper man of the oil regions, has returned to the scenes of his early journalistic career, and is once more located at Oil City. He is associated with Mr. P. C. Boyle in the management of the *Derrick*, and is receiving hearty welcomes from all quarters. Pat and the *Derrick* are in high feather over the acquisition to the force, and the AGE extends hearty greetings to the new coalition.

THE pipe line runs from the Washington field averaged 13,143 barrels a day in September, 12,184 barrels in October, 9129 barrels in November, 8841 barrels in December and 6930 barrels in January.

BLUE print maps of the Reibold Oil District furnished from the AGE office for one dollar.

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THE PRODUCING REGION.

At the beginning of January there were 74 new rigs and 239 drilling wells in the New York and Pennsylvania oil regions, a total of 313. The number of wells completed in January was 159, with an estimated new production of 3707 barrels. The dry holes numbered 37, leaving 122 productive wells with an average yield of a little more than 30 barrels. During December the entire region completed 157 productive wells and 22 dry holes, and the average of the new wells was 30 barrels. The average of the November wells was 31 barrels, of the October 30, of the September 62, and of the August 48 barrels. The January figures show a decrease of 30 wells and 419 barrels new production, while December decreased 27 wells and 1235 barrels new production. At the close of January there were 78 new rigs, 124 old rigs and 196 drilling wells in the entire region, a total of 398, as compared with 74 new rigs, 133 old rigs and 239 drilling wells, a total of 446 at the close of December. This is an increase of 4 new rigs, a decrease of 9 old ones, and a decline of 43 drilling wells, or a total decrease of 48 in active operations. December showed a decline of 95 from the figures of November. At the close of January, 1886, the record showed 273 new rigs, 123 old rigs and 331 drilling wells, a total of 727.

ALLEGANY FIELD.

But four wells were completed in the Allegany field in January, and the new operations at the close of the month numbered 5 rigs and 6 drilling wells. Thirty-four old rigs are standing in various parts of the field, and the majority of these will probably never be drilled. The pipe line runs averaged 4920 barrels a day in January, 5072 barrels in December, 5260 barrels in November, 5885 barrels in October, 6035 barrels in September, 6333 barrels in August, 6802 barrels in July, and 6981 barrels in June. The average daily runs for January, one year ago, were 6235 barrels; for January, 1885, 7445; for January, 1884, 11,018, and for January, 1883, 14,106 barrels.

THE BRADFORD FIELD.

Twelve producing wells were completed in the Bradford field in January. Of the three dry holes enumerated in the list two were gas wells and the third a pronounced duster, which was located in the Conroy & Johnson district, north of Four-Mile and south of Allegheny village. One of the gas wells was found on the Mack lands by the Manufacturers' Gas Company, of Bradford, to the west of the defined borders of the northern field, and the other the property of the Duke Centre Gas Company, is situated between Duke Centre and Eldred, on the northeastern edge. At the close of the month there were but 9 new rigs and 14 drilling wells in the field, against 8 new rigs and 19 drilling wells at the close of the month preceding. The pipe line runs of the Bradford field averaged 23,133 barrels a day in January, 24,002 in December, 24,690 in November, 24,596 in October, 26,394 in September, 26,785 in August, 27,587 in July and 28,790 in June. For January, 1886, the runs averaged 27,966 barrels; January, 1885, 27,254; January, 1884, 31,020; January, 1883, 36,487, and for January, 1882, 55,006.

WARREN AND FOREST.

There were 39 wells completed in the Middle field in January, 7 of which were failures, and the new production was 260 barrels. This is a decline of 16 wells and 102 barrels production from the figures for December, and is the smallest month's work recorded by the Middle

field in several years. On the 31st of January there were 21 new rigs, 23 old rigs and 30 drilling wells, against 13 new rigs, 25 old rigs and 33 drilling wells at the close of December.

Kinzua Village completed three good wells in January on the west side of the river, and the two firms who control all the available land, feel highly elated over the secure possession of a large area of valuable territory, which is not likely to be crowded with wells too thickly to endanger the profits. T. G. Phillips scored a duster up Sugar run, and Johnson & Co. are credited with the same result at their venture on the Crandall lands, within the western borders of McKean county.

In the Clarendon field a duster, on lot 555, and a gas well on lot 56, serve to mark out more strongly the limits of productive territory to the west and the east. Northeast of Balltown, Horton, Crary & Co., opened up an old duster in the southeast corner of lot 741, and with the aid of a torpedo succeeded in making a ten-barrel well of it. The firm will make another test on the same lot. A well is drilling on lot 4, of the Cooper tract. The Cooper runs were 457 barrels, and the Balltown 525 barrels a day in January.

Kane is down to three completed wells a month, and the production as shown by the pipe line runs has declined to 2956 barrels a day. There is little doing in the Grand Valley field proper, but the region to the southwest of the district is being explored, with good indications for small pools along the outlying edges of Enterprise and Pleasantville. On the western borders of Forest county, below Pineville, Dunham & Conrath drilled a well on the Lander's farm that started at 18 barrels a day without a shot. It is directly east of Pleasantville, and has stimulated a little activity in that region. Philip Serene found a good well on the Cheney or Hatmaker farm, lot 183, of Southwest township, in Warren county.

ELK COUNTY, ETC.—The deep territory southwest of Kane is credited with three six-barrel wells as the outcome of the past month's work. Operators are not disposed to hurry matters in this section, as six-barrel wells in Elk county are slow to yield returns at present market prices. The Coast & Son's well, near Beech Bottom, on warrant 5797, is reported a failure, while the Shannon test, on warrant 5504, in Forest county, has been drilled to the proper depth, with the same result.

THE LOWER COUNTRY.

There were 101 wells completed in the Lower country in January and 27 of them were failures so far as producing oil is concerned; the new production was rated at 3345 barrels. On the last day of January the Lower country had 43 new rigs and 146 drilling wells, as compared with 49 new rigs and 177 drilling wells on the last day of December.

VENANGO.—There were only 32 wells completed in Venango county in January, 13 of which were failures, and new operations are about the same as they were at the close of December. No new pools are attracting attention and the old sections are devoid of interest. Few wild-cat wells are under way and this class of operators have had much to discourage them in the past few months. There is still a small degree of activity noticeable at Tarkill, Tipperary and Red Valley, but the operations are very small compared with what they have been. The runs from these districts averaged as follows during January: Tarkill, 764 barrels a day; Tipperary, 179, and Red Valley, 632.

CLARION.—The Clarion field is credited with 8 completed wells in January, 2 of which were dry. Barnum

& Leasure, on warrant 3674. east of Newmanville, secured one of the dusters and McCleary Bros. the other. On the first day of the month there were 7 new rigs and 8 drilling wells, as compared with 2 new rigs and 10 drilling wells on the 1st of January. The Cogley runs averaged about 1300 barrels a day in February.

BUTLER AND ARMSTRONG.

At this writing, February 12th, the Reibold pool continues in an experimental condition. Thomas W. Phillips & D. Osborn and Leidecker Bros., who have nearly all the territory leased in the immediate front of the producing wells have, together 20 new rigs and drilling wells. Outside of their operations H. H. Stow & Smick are getting ready to drill on the Miller farm, about 100 rods east of the old Lenz well, on the C. Markle farm, and Root & Johnson are drilling on the Blakeley. The wells now under way will test the country as far to the southwest as the tunnel wells. How the belt will pass these wells is a problem which is puzzling operators at the present time. Thomas Phillips is seeking vindication through the agency of the drill of his theory of a belt running between the or to the north of the tunnel wells. He and Henry Lenz are drilling a well on the north side of the railroad, on the Gelbach farm, which will test the middle ground between these two wells. Phillips & Osborn have completed two wells on the Heid farm, during February, which have shown the Reibold field capable of affording wells which will produce 60 barrels per hour during the flush of their new life. No. 4, on the Heid farm, struck the pay streak about noon on February 4th, and flowed at the rate of 60 barrels per hour when at her best on the afternoon of that day. At the end of the fifth day Heid, No. 4, was producing between 28 and 35 barrels per hour. Heid, No. 3, failed to hold its production up to the standard established by No. 4, and on the morning of February 8th was producing 10 barrels per hour. It was given a two quart torpedo on that day which increased its production to 15 barrels per hour. On the 9th it had declined to 7 barrels per hour. The well on the C. Markle farm, near the Glade run trestle, has been torpedoed four times with small shots. It was stimulated for the fourth time on February 3d, and its production was increased from 120 to 350 barrels per day. During the second twenty-four hours after this shot the well gauged 315 barrels. Phillips & Osborn's No. 2, on the Heid farm, was given a torpedo on February 7th which increased its salt water and decreased its production. The well has since been tubed and the use of the sucker rod is improving its daily yield. The production of the field for twenty-four hours, ending at noon Saturday, February 5th, was 3500 barrels from twenty-two wells. On the following Wednesday it had declined to 2416 barrels. Operations are growing quiet in the Hickey district and a batch of wells were completed in January which afforded a light average. Thorn Creek producers are pretty well satisfied with the work they are doing and the returns which it brings. The wells are said to have good staying qualities in this annex of the Thorn Creek pool. The test well which was sunk on the Belford farm, near Mars Station, and a short distance from the producing well on the same farm was dry. The Breakneck Oil Company's well, on the Widow Croft farm, a half mile southeast of Callery Junction, was barren of oil in the regular sand, which was thin and of inferior quality. The rig has been torn down and will be rebuilt on a location further to the north. The new development at Reibold will give an impetus to wild-cattling in the west and southwest end of Butler county.

SHOUSTOWN.

When the AGE representative visited the Shoustown or Shannopin field, toward the close of January, the Kennedy Oil Company's well, on the Kennedy farm, across the county line, and in Allegheny county, was pumping 17 barrels per day. The well on the Bailey farm, near Clinton postoffice, which had a showing of oil in the shallow sands, was pronounced a failure. The wells completed in the Shannopin field during January afforded a smaller average production per well than has been reported for any month since the field was discovered. The yield of the field is not being maintained and a still further decline is naturally to be expected. With the exception of a narrow streak running to the southwest from the Thompson and other farms to the Kennedy farm well, a further enlargement of the field is not looked for by oil men. The McDonald Oil Company's well, on the McCutcheon farm, about a half mile in advance and to the east of the Kennedy farm well, was barren of oil. On the north side of the Ohio river the Union Oil Company and J. M. Guffey & Co. keep up their search for oil in the Mt. Nebo section. On the 1st of February the Union Oil Company had three wells drilling, and the one on the Pinkerton farm has since come in dry. The western part of Allegheny county is in the geographical range of the oil pools and affords many allurements to the wild-catter. The whole country southwest of the Butler field, and far into West Virginia and Ohio, is being overrun by the oil prospector.

WASHINGTON.

After the pay streak in the bottom of the Gantz sand at the McGahey, No. 5, was struck great hopes were entertained for the territory lying to the northeast, but the downward course of the drill set at naught these expectations, and the development which gave promise of an indefinite extension has been stopped one location in advance of the inspiring gusher. Reed & Co.'s venture, on the O. C. C. Pollock farm, a mile and a quarter in advance of the Mascot Oil Company's wells, was the first to reach the sand in January. The Gantz sand at this well had a thickness of 17 feet and was struck at a depth of 2267 feet. There was a "break" of 26 feet of slate between the two sands, and the fifty-foot was tapped at 2310 feet. There was but 21 feet of this complement of the Gantz sand, and below this the drill passed into slate. In order to satisfy a thirst for geological research the Associated Producers took hold of the well and drilled it below the level of the Gordon sand. This lower rock was of inferior quality, but had a thickness of about 40 feet. The well disclosed a small amount of rank smelling gas, but failed to give the slightest indications of crude. The Manufacturers' Natural Gas Company's well, on the northern end of the Linn farm, was condemned by the Mascot Oil Company's Nos. 3 and 4, on the McGahey farm, but the owners concluded to drill it to the sand, thinking that a large gasser might be struck. John McKeown's No. 11, on the Munce farm, and his No. 3, on the Martin, came in good wells and indicate that the belt will pass from the Smith to the McGahey pool. The well on the Martin farm when at its best produced 700 barrels in twenty-four hours. The Union Oil Company's No. 7, on the Davis farm, and supposed to be on the southern or eastern side of the belt, is a remarkably large well and has wonderful staying powers. On the 17th of January it was 25 feet in the Gantz sand and produced 500 barrels per day, and after being drilled deeper it flowed 1300 barrels in its best twenty-four hours. A pay streak was encountered

1000 b. well a month old!

3' ga

THE PETROLEUM AGE.

1555

in the fifty-foot and from both sands it is producing 1000 barrels per day when a month old. Pew & Emerson's No. 3, on the Manifold farm, located about 500 feet northwest of the Manifold, No. 1, was dry in the Manifold sand or "Big Injun," as the rock has been named by one of the pioneer contractors in the field. The three wells which get their oil from this shallow sand remain undisturbed in their isolation. While the northern or western boundary line of the old field is well rounded out, and governing points are established for the southern or eastern limits of the field, considerable drilling must be done on this side to locate precisely its border. The Gordon pool has afforded only a small amount of the production of the Washington field and adds one well of importance in February. The P. L. & H. Co.'s No. 6, on the Gordon, has been torpedoed, and on the 12th of the month is producing at the rate of 480 barrels. The Taylorstown field will cross the visual range of the speculator and producer this month. There are seven wells drilling in this section and two of them are expected to be drilled into the Gordon sand during the week, which will end February 19th. At this writing, the 15th instant, the West Virginia Natural Gas Company's well, on the Carson farm, is drilling below the level of the fifty-foot, and the drill, barring accidents, is sure to tap the Gordon sand as early as the middle of the week. The Carson well, according to the log book of the drillers, failed to find any Gantz sand and had less than 10 feet of the fifty-foot. They are building a 600-barrel tank at the well of Hart Bros., on Blayne farm, and at this well the drill has also passed below the level of the Gantz sand and fifty-foot. The old well gets its oil from the Gordon sand, and, consequently, a well has but one chance in this field. If the Taylorstown section is anything like the Gordon pool in the old field it will be a small factor in considering the crude problem.

Below is a list of all wells in the field which were producing January 8th, with their production on that date and the same wells with new ones added to the list with their yield on February 12th:

Farm.	Operator.	Produce.	Produce.
		Jan. 8.	Feb. 12.
		Barrels.	Barrels.
Gordon, P. L. & H. Co.,	No. 1	8	16
"	No. 4	16	9
"	No. 5	30	26
"	No. 6	--	480
Hess,	No. 2	--	6
"	No. 3	10	10
"	No. 4	--	8
Gantz, Citizens' Oil & Gas Co.,	No. 1	28	30
Weaver,	No. 3	8	8
Weirich, Forest Oil Co.,	No. 1	10	10
"	No. 2	14	12
Barre,	No. 1	106	30
"	No. 2	80	78
"	No. 3	62	90
"	No. 4	33	80
"	No. 5	200	125
"	No. 6	480	420
"	No. 7	--	--
"	No. 8	--	45
"	No. 9	--	40
"	No. 11	54	50
Hall,	No. 1	--	--
"	No. 2	25	10
"	No. 3	--	10
"	No. 4	--	--
Curry,	No. 1	25	22
Taylor, Union Oil Co.,	No. 1	60	40
"	No. 2	40	40
"	No. 3	40	35
"	No. 4	45	35
"	No. 5	70	50
"	No. 7	--	25
McGovern,	No. 1	23	23
Clark,	No. 1	10	7
Dye lot,	No. 1	105	45
Morgan,	No. 1	110	40
"	No. 2	15	10
"	No. 3	25	12
"	No. 5	85	65
"	No. 6	15	10
Davis,	No. 1	60	50
"	No. 2	300	--
"	No. 3	50	40
"	No. 4	530	210

Farm.	Operator.	Produce.	Produce.
		Jan. 8.	Feb. 12.
		Barrels.	Barrels.
Davis, Union Oil Co.,	No. 5	25	25
"	No. 7	--	1020
Linn, Coast & Co.,	No. 2	80	50
"	No. 3	15	15
"	No. 4	45	25
Weirich,	No. 1	12	14
Hayes,	No. 1	10	7
Lead Works Lot, McKeever & Mulholland,	No. 1	20	22
"	Marsh & Caldwell,	8	12
Smith, Willets, Young, Craig & Co.,	No. 1	8	6
"	"	No. 3	46
"	"	No. 5	63
"	"	No. 6	63
"	"	No. 7	267
Cameron,	"	No. 1	55
"	"	No. 2	10
"	"	No. 4	168
"	"	No. 5	187
"	"	No. 6	55
"	"	No. 7	119
Shirls, Shirls,	No. 1	45	25
"	No. 2	--	15
"	No. 3	--	3
Stewart, Fisher Oil Co.		131	24
Miller, Guffey & Co.,	No. 1	50	40
Hall, Guffey & Co.,	No. 1	7	5
Manifold, Pew & Emerson,	No. 1	55	15
"	No. 2	45	52
Gabby,	No. 1	5	5
Clark, Thayer & Co.,	No. 1	9	29
"	No. 2	93	157
"	No. 3	22	26
"	No. 4	83	40
Clark, Thayer & Co.,	No. 5	21	25
"	No. 6	--	--
Munce, Willets & Son,	No. 1	63	58
"	No. 2	1	1
"	No. 3	58	24
"	No. 4	5	--
Munce, Willets & Son,	No. 5	--	--
"	No. 7	45	52
"	No. 8	--	50
"	No. 9	140	30
"	No. 10	30	--
"	No. 11	27	--
"	No. 12	160	40
"	No. 13	25	20
"	No. 14	50	--
"	No. 15	--	300
"	No. 16	--	40
"	No. 17	40	50
"	No. 19	40	50
"	No. 20	--	--
"	No. 21	20	30
"	No. 22	--	--
"	No. 28	--	100
Montgomery, J. L. McKinney & Co. & Robbins,	No. 1	9	9
"	No. 3	25	--
Taylor, Galligan & Co.,	No. 1	--	40
Clark, Hallam & Co.,	No. 1	5	5
Wiley, Munhall & Co.,	No. 1	17	10
"	No. 2	7	7
Vandergrift, Taylorstown,	No. 1	75	70
Munce, John McKeown,	No. 1	--	200
"	No. 2	--	--
"	No. 3	--	--
"	No. 4	430	230
"	No. 5	--	--
"	No. 6	--	--
"	No. 7	--	--
"	No. 10	--	--
"	No. 11	--	200
Fergus, Chartiers Oil Co.		42	36
Fair Ground, Wheeling Oil Co.,	No. 1	100	90
Fair Grounds, Wheeling Oil Co.,	No. 2	50	40
"	No. 3	--	12
Zelt, Associated Producers,	No. 2	10	5
Wiley, Associated Producers,	No. 2	--	--
Martin,	No. 1	--	30
Miller, Reed & Co.		408	25
Weaver, Hart Bros.		--	30
Martin, Central Oil Co.,	No. 1	153	65
"	No. 3	--	--
Wade, B. B. Campbell		123	115
Thome, Andrews & Connors,	No. 1	12	10
"	Lee & Shank,	87	65
McGahey, Mascot Oil Co.,	No. 1	90	50
"	No. 5	432	264
"	No. 7	--	25
Wright, Craig & Andrews,	No. 1	22	14
"	No. 4	--	240
Quail, John McKeown,	No. 1	22	10
Van Kirk, Caldwell & Co.,	No. 1	4	3
McKean,	No. 1	--	20
Martin, John McKeown,	No. 3	--	160
Watson, Butler & Co.,	No. 1	--	40

Date.	No. wells.	Production Barrels.
February 12, 1887	140	7,885
January 8, 1887	122	7,425
Difference	18	40

THE Philadelphia Company has laid the largest gas main ever put down in this country. It is a 36-inch pipe and extends from Torrens Station, on the Pennsylvania Railroad, down Liberty to Tenth street, Pittsburgh.

SEDIMENT AND SURPLUS.

SOME INSTRUCTIVE FIGURES BY MR. M. W. QUICK.

THE law regulating pipe companies is intended to give the holders of petroleum certain protection and information regarding the business and condition of the companies engaged in the transportation and storage of this great product. The people, through their representatives, became parties to this law, and the statements furnished by the pipe companies become the property of the people. During the last few years there has been a growing dissatisfaction among producers owing to the exactions of the pipe companies in the percentages charged on oil delivered from oil wells for transportation, and the murmur heard in the past has now grown to a loud note of complaint. Holders of oil are also led to complain of the rates charged for storage. With the market price of tankage (in the old fields) fixed at about 6 cents per barrel, it is not easy for them to see equity in the exaction of 14 6-10 cents per barrel per year for the use of similar tankage.

The percentages charged for evaporation and waste, and the rates fixed for storage, are arbitrary; the people interested in holding and producing oil were not permitted to become parties to the arrangement, except by the endorsement that came through their inability to participate in the establishment of rates, and fixing tolls, that should become a tax on their business and their property.

Refined, and the greater portion of the products manufactured from crude oil, are sold by weight. The basis for the receipt and delivery of crude should therefore have a more substantial foundation. To establish a standard of temperature—say 60° F.—adding 1 per cent. in quantity for every 10° below 60° F., and deducting 1 per cent. from the quantity for every 10° above 60° F. on all receipts from wells, and on all deliveries to refiners, would seem to do injustice to none. This would give a basis of adjustment that all could understand, and be much more satisfactory than the present sliding scale, applicable alone to the oil received and delivered from wells, and changing from time to time, the correctness of which the producers have no means for verifying. If the quantity of oil actually expands and contracts 1 per cent. for every change of 10° in temperature, as claimed by the pipe companies, the method suggested above would seem to be a just basis of calculation, and in the interests of all dealers in actual oil.

THEN AND NOW.

Prior to the year 1877, 2 per cent. was the usual deduction for the evaporation and waste on oil received from well tanks by the pipe companies, and no charge was made for evaporation and waste of oil held against the account of tankage owned by the customers of the pipe lines who surrendered the same to the pipe companies. Well tanks during this period were poorly protected; steaming oil at the wells was an innovation of the future; and when in April of that year there was a "combine" of pipe companies under the title of the United Pipe Lines, and notice was issued that they would thereafter deduct 3 per cent. on all oil received from wells, and charge the owners of private tankage 3 per cent. per year for evaporation and waste on oil held for them, there was little, if any, complaint; possibly owing to the fact that there were many persons in the oil country who knew that 2 per cent. tolls were not sufficient to cover the waste on oil received from oil

wells, and who knew equally well that there was an actual loss on stock oil held in the imperfect tankage of that day. In connection with these changes the producers were allowed 1 per cent. per barrel for furnishing steam to pump their oil into the pipe lines. Subsequent to this the pipe line issued notice that the charge for storage on credit balances, and on certificates issued for oil, would be subject to a charge of 1¼ cents per barrel per month, and the assurance was given that this rate would not be increased while the market price of oil remained below \$1.50 per barrel. (The loop hole was supposed to be justified by the fact that the waste and loss on holding oil in tanks was equal to 3 per cent. per year which, under the cash basis for storage, the pipe line was to buy, and this they would not assume to do if oil should go to a price higher than the one named.) The next general order was to cease paying producers for the steam furnished to do the work of the pipe line, and this was followed by the refusal of the company to accept oil unless it had been steamed and thoroughly settled, the result of which is seen by an examination of the published statements following this period. The reports of the National Transit Company published during the last year (1886) will explain the situation at present. The statements referred to present the following exhibit of the receipts, deliveries, stocks and liabilities:

Liabilities at close of 1885.....	32,129,184.82
Receipts during 1886.....	21,036,771.29
Total to be accounted for.....	53,165,956.11
Deliveries during 1886.....	22,546,721.67
Liabilities at close of 1886.....	30, 36,518.46
Balance unaccounted for.....	80,715.98
Total.....	53,165,956.11

The "balance to be accounted for," of 80,715.98 barrels, is the provision made by the National Transit Company to replace shrinkage and waste on the stocks of oil held by that company during 1886, and which averaged more than 31,000,000 of barrels.

SEDIMENT AND SURPLUS.

The charge, or deduction, for shrinkage on heated oil is 1 per cent. for every 10° F. above the standard temperature, as fixed by the pipe company, which standard is supposed to be the temperature of the stocks of oil held in iron tanks. This standard at the close of 1885 was 32°; at the close of 1886 26°. If the adopted basis for calculating contraction and expansion is correct, the gross stocks at the close of 1886 should be increased 6-10ths of 1 per cent. in order that the relation of the "sediment and surplus" at the two periods may be compared. This addition makes the "gross stock" held at the close of 1886, 33,663,628.09 barrels, and the "sediment and surplus"—or difference between "gross stocks" and "liabilities"—3,123,109.63 barrels. The "sediment and surplus" thus held at the two dates, to make the "gross stocks" (which include thick oil, sediment and water) adequate for the delivery of the "liabilities" of the company, was:

At the close of 1885.....	8.985 per cent.
At the close of 1886.....	9.285 per cent.

It being evident that the National Transit Company are not drifting into bankruptcy, let us return to the balance of 80,715.98 barrels, and see if it can in any way be accounted for. As shown it is a cancellation or reduction of "liabilities," without a corresponding delivery of oil. This could have been brought about by the purchase of "credit balances" or "certificates" charging them to the account they represent, thus reducing the "liabilities" and increasing the difference between "liabilities" and "gross stocks," and showing an increase in "sediment and surplus," or it could have

been orders drawn by customers of the company on their individual balances, or by charges against the same to pay the 3 per cent. per year shrinkage charge on oil held in private tankage entrusted to the care of the company. This would also reduce the "liabilities" and increase the "sediment and surplus."

An examination of the statements of the pipe company, extending through a series of years, shows that there is a uniform reduction of "liabilities" from cancellations provided by the per cent. charged private tank owners, and that when the pipe company purchase for evaporation their purchases are made in a comparatively short space of time. The cancellation of the 80,715.98 barrels of "liabilities" occurred, however, in the following order:

January	9 016 46
February	7,592.51
March	8,017.58
April	10,612.83
May	8,060.43
June	2,971.74
July	5,654.39
August	4,499.40
September	6,442.66
October	8,446.79
November	4,525.46
December	4,965.73

Total cancellations during 1886..... 80,715.98

Judging from the past, and from the well-known custom of charging shrinkage on oil held in private tankage, this would seem to be reasonably presumptive evidence that the entire shrinkage on the stocks of the National Transit Company was provided for by deductions made on oil received from oil wells and by tolls on oil held in private tankage.

On September 1, 1883, the Oil Exchanges, by invitation, joined with the United Pipe Lines (since changed to the National Transit Company,) in making a gauge and inspection of the quantity and quality of oil held by that corporation. The per cent. of "sediment and surplus" as compared to the "gross stocks" at that time was 6.6367, and the official gauge, made in the presence of and verified by the committee appointed by the Exchanges, showed a surplus over and above the liabilities of the company to the amount of 667,806.71 barrels, or that 28.534 per cent. of the "sediment and surplus" was the equivalent of good oil. This basis of calculation gives the surplus of the National Transit Company on January 1, 1887, as 960,557.96 barrels, or more than 3 per cent. of the entire stocks held.

The "runs" or "receipts from wells" are but 97 per cent. of the total. The 3 per cent. tolls thus collected—making no allowance for the deduction on account of temperature—were 650,621.79 barrels. Adding to this the 80,715.98 barrels collected on oil held against private tankage, and we have a total of 731,337.77 barrels as the provision for evaporation and waste. This amount, as has been shown, increased the "sediment and surplus" nearly three-tenths of 1 per cent. (.298), as compared with the "gross stocks." This is an increase of actual oil—based on the per cent. arrived at from the gauge of 1883—of 34,124.14 barrels. This gain being deducted from the 731,337.77 barrels shown as the provision for loss, leaves the evaporation and waste, from all causes, during 1886, as 697,213.63 barrels.

There would seem to be no question but that the percentages charged are largely in excess of the actual losses experienced in handling and storing oil. The pipe lines have learned that they can avoid accepting unmerchantable oil, and that tankage can be constructed so that the loss on oil held in stock is reduced to a minimum, yet they have in no way made the concessions due their patrons when these facts are taken into con-

sideration. That a modification can be made which will in no way endanger the solvency of the pipe companies is conclusive.

In illustration of what would have been the result of a reduction in the tolls during 1886 to 2 per cent. on oil held in tankage, and to one-half of 1 per cent. on oil received for transportation by the National Transit Company, we have:

Two per cent. on 31,000,000 stocks.....	620,000.00
One-half per cent. on receipts.....	105,183.85
Provision for loss.....	725,183.85
Estimated loss as shown.....	697,213.63
Excess of provisions for loss.....	27,970.22

There are other facts that can be drawn on, if necessary, to show that the tolls and the storage rates are excessive to the extent of being extortionate. Coupled with this we have the greater evil in the Oil Exchanges, with their perfected systems for multiplying this extortionate storage and for collecting the same on "short sales," and for making the price of actual oil by so-called purchases and sales that involve no oil. Supported and patronized as these two evils are by the power that has dictated the storage rate, and through whose influence the rules of the Exchanges have become the only law in the petroleum trade, we find the courts closed against us, and a threat constantly hanging over the producer and holder of oil. With a rate of storage that is burdensome, beyond reason or excuse, facilities are offered to multiply the real stocks for the purpose of collecting storage on the unreal. Under the present usages no one knows, and no one can know, to what extent the extortionate storage on 30,000,000 barrels of oil is multiplied, or to what extent this piratical tax adds to the magnificence of the oil kings outside of the State, who hold the value of our labors subject to their will. To make it possible to collect this storage on the unreal the value of our product must of necessity be kept chronically low in order that there may be constant inducements for the buyers to purchase of the unreal stock and become contributors for storage on oil that never had an existence. With a skillful hand this glittering bait is so manipulated that it presents the attractive lure of the genuine, yet in the end it proves no more succulent than the tinsel fly that lures the wary trout to destruction.—*Pittsburgh Dispatch*.

SUMMARY of the Statement of the Tidewater Pipe Company, Limited, for January, 1887:

	Barrels.
Quantity of crude petroleum in custody at beginning of January.....	1,369,422.03
Quantity of crude petroleum at close of Jan. 1, 1887.....	1,594,561.49
Less sediment and surplus.....	151,022.85
Receipts during January.....	1,443,538.64
Received in iron tanks.....	186,466.74
Deliveries during Jan.—to refiners.....	59,854.56
“ “ “ to other parties.....	168,401.06
Outstanding certificates, accepted orders, etc.....	719,000.00
Credit balances.....	724,538.64
Total liabilities, January 31, 1887.....	1,443,538.64

DECEMBER SUMMARY.

	Barrels.
Quantity of crude petroleum in custody at beginning of December.....	1,368,198.05
Quantity of crude petroleum at close of Dec. 1, 1886.....	1,513,095.63
Less sediment and surplus.....	143,673.60
Receipts during December.....	1,369,422.03
Received in iron tanks.....	187,241.39
Deliveries during December—to refiners.....	58,891.90
“ “ “ to other parties.....	241,736.92
Outstanding certificates, accepted orders, etc.....	241,736.92
Credit balances.....	714,000.00
Total liabilities December 31, 1886.....	655,422.03
Total liabilities December 31, 1886.....	1,369,422.03

THE Chartiers Natural Gas Company has increased its stock to \$3,000,000.

BLUE print maps of the Ohio oil fields to be had at the AGE office.

Comparative Statement.

STATISTICAL SUMMARY OF THE PETROLEUM SITUATION.

	1887. January.	1886. January.
Wells completed.....	159	265
New production.....	3,707	2,983
Dry holes.....	37	45
New rigs.....	78	273
Old rigs.....	124	123
Drilling wells.....	196	331
Total field operations.....	398	727
Average daily pipe line runs.....	62,629	56,418
Average daily shipments.....	71,332	62,244
Total stocks custody pipe lines.....	32,170,678	33,283,881
THE MARKET.		
Refined in New York.....	6¾	7½
Opening price of crude for the month.....	70	88½
Highest price of crude for the month.....	72½	92¼
Lowest price of crude for the month.....	67¾	81½
Closing price of crude for the month.....	69¾	82½
Average price of crude for the month.....	71	83¾

WHITE SAND POOLS.

CHERRY GROVE, COOPER AND BALLTOWN PIPE LINE
RUNS TO JANUARY 31, 1887.

	Ch'y Gr'Ve. Bbls.	Cooper. Bbls.	Balltown. Bbls.	Total. Bbls.	Daily Av'ge. Bbls.
Total 1882.....	2,345,400	29,864	2,700	2,377,964	9,706
Total 1883.....	755,512	1,095,558	776,244	2,627,314	7,198
Total 1884.....	264,942	1,004,849	807,506	2,077,297	5,691
Total 1885.....	135,809	340,924	348,098	824,831	2,260
1886.					
January.....	9,478	19,320	32,953	61,751	1,992
February.....	8,552	15,987	29,579	54,118	1,933
March.....	10,942	20,227	32,839	64,008	2,065
April.....	10,403	17,499	24,979	52,881	1,763
May.....	10,477	18,322	42,660	71,459	2,305
June.....	10,324	18,154	33,126	61,604	2,053
July.....	16,731	18,050	35,976	64,757	2,089
August.....	9,305	17,289	24,788	51,382	1,657
September.....	7,671	14,465	27,384	49,520	1,651
October.....	7,723	15,348	20,677	43,748	1,411
November.....	6,949	12,613	20,630	40,092	1,336
December.....	6,320	14,280	20,721	41,321	1,333
Total 1886.....	108,875	201,454	346,312	656,641	1,799
Tot'l Dec. 31, '86.	3,610,538	2,672,649	2,280,860	8,564,047	5,020
1887.					
January.....	6,072	14,185	16,296	36,553	1,179
Tot'l Jan. 31. 87.	3,616,610	2,686,834	2,297,156	8,600,600	4,951

The above table gives the statistical history of the Cherry Grove, Cooper and Balltown fields from the time oil was first run in each district to January 31, 1887. Cherry Grove has produced 3,616,610 barrels, Cooper 2,686,834, and Balltown 2,297,156 barrels. The daily average runs from the three fields during January were 1179 barrels, a decrease of 154 barrels from the December figures.

The daily average runs from the Cooper and Henry's Mills section for January were 458 barrels, for December 460 barrels, November 417 barrels, October 495 barrels, September 482 barrels, August 558 barrels, July 582 barrels, June 605 barrels, May 591 barrels, for April 583 barrels, for March 653 barrels, and for February 571 barrels.

The Balltown field had a daily average of 526 barrels in January, 668 barrels in December, 688 barrels in November, 667 barrels in October, 913 barrels in September, 800 barrels in August, 1161 barrels in July, and 1104 barrels in June. Cherry Grove averaged 196 barrels in January, 204 barrels in December, 232 barrels in November, 249 barrels in October, 256 barrels in September, 300 barrels in August, 346 barrels in July, and 344 barrels in June.

The total pipe line runs from the three fields since oil was first run from Cherry Grove, in May, 1882, up to January 31, 1887, inclusive, has been 8,600,600 barrels, a total daily average of 4951 barrels. The greatest average runs from the Cherry Grove district were in August, 1882, when they reached 24,315 barrels.

BALDRIDGE AND COGLEY RUN.

The runs from Baldrige since April 1, 1884, and from the Cogley district since May 15, 1885, have been as follows:

MONTH.	Baldrige Runs.	Daily Average	Cogley. Runs.	Daily Average.
April.....	23,325	844		
May.....	32,885	1,061		
June.....	29,070	969		
July.....	27,545	889		
August.....	26,134	843		
September.....	79,324	2,644		
October.....	187,068	6,034		
November.....	284,806	9,493		
December.....	270,644	8,730		
January, 1885.....	192,180	6,199		
February.....	205,774	7,349		
March.....	221,398	7,239		
April.....	280,005	9,333		
May.....	232,138	7,488	3,927	127
June.....	105,774	5,905	18,266	609
July.....	119,531	3,856	37,848	1,220
August.....	70,318	2,263	65,570	2,115
September.....	60,637	2,021	97,325	3,244
October.....	58,834	1,898	153,110	4,939
November.....	44,081	1,469	162,476	5,416
December.....	44,011	1,420	162,479	5,241
January, 1886.....	39,933	1,288	138,549	4,469
February.....	34,094	1,218	111,144	3,970
March.....	42,430	1,369	119,270	3,847
April.....	38,983	1,299	108,541	3,618
May.....	37,752	1,218	100,994	3,258
June.....	40,167	1,339	88,082	2,936
July.....	40,631	1,311	77,584	2,503
August.....	42,097	1,358	67,405	2,174
September.....	41,652	1,388	60,140	2,004
October.....	41,835	1,349	57,031	1,840
November.....	41,843	1,395	49,098	1,636
December.....	45,038	1,453	42,198	1,361
January, 1887.....	50,377	1,632	-----	-----

For the twenty months ending with December 31 the Cogley oil field has produced 1,723,295 barrels of oil, a daily average of 2895 barrels. The daily average for 564 days ending November 30, was 2977 barrels. Since December 31 the runs from the Cogley field are no longer kept separated, on the pipe line books, from the general runs of the entire Clarion field.

The Thorn Creek and Baldrige runs averaged 1632 barrels a day in January, 1453 barrels a day in December, 1395 barrels a day in November, 1349 barrels a day in October, 1388 barrels a day in September, 1358 barrels a day in August, 1311 barrels a day in July, and 1339 barrels a day in June. This is exclusive of the oil run by the Pittsburgh Pipe Lines, which receive over 1200 barrels a day from Butler county.

The Rockland or Red Valley district, in Venango county, commenced running oil in October, 1885, and up to the 31st of January had produced 421,435 barrels; a daily average for 488 days of 863 barrels.

The Tarkill pool in Venango county averaged 427 barrels a day in March, 764 barrels a day in April, 915 barrels a day in May, 1262 barrels a day in June, 4038 barrels a day in July, 3756 barrels a day in August, 2258 barrels a day in September, 1009 barrels a day in October, 920 barrels a day in November, 853 barrels a day in December and 764 barrels a day in January. The Excelsior Pipe Line commenced running oil from this field in September, and its runs are not included in the preceding figures. The Pontiusor McKeever pool, in Butler county, produced 71,710 barrels in January, 76,645 barrels in December, 82,962 barrels in November, 90,777 barrels in October, 84,126 barrels in September, 85,331 barrels in August, 70,458 barrels in July and 70,489 barrels in June.

The runs from the Tipperary district in Venango county were 4800 barrels in October, 6156 barrels in November, 5324 barrels in December and 5543 barrels in January.

OPPERMAN'S Middle Field pocket maps for sale at AGE office.

The Tug Fork Gas Region.

The gas situation on Tug Fork is interesting and unique. There is a big gas well flowing with unparalleled exuberance. Its blazing column scatters radiance for thirty miles around—enough to illuminate a populous valley and set a million wheels to going. But alas, it is burning in the woods, to the amazement and discomfort of the owls and raccoons.

Warfield is a doleful hamlet on the west bank of Tug Fork. There lives Colonel J. A. Barrett, who owns 5000 acres of land that surround the well, and which are supposed to cover immeasurable reservoirs of gas. Colonel Barrett is not a native. He came there in 1886 to operate in a quiet way the salt well already in slow and painful operation, and to open up the vast coal areas. Before the war, he was a citizen of Illinois, and for years was a partner of Abraham Lincoln in the practice of law. So, his present location and past affiliations make him an interesting figure. With him are his two sons, one a lawyer and the other a merchant. The latter is married to a lady who used to live in Ironton, Miss Tish Dorsey, whose mother yet resides here.

The region of Tug was always an interesting spot. Ever since the white man scoured that romantic section gas issued from the soil. It is said that General Washington fired the subtle gas at Burning Spring, while surveying that country away in the back century; and we may remark, with becoming modesty, that the writer of this article did the same thing when a boy, nearly thirty years ago.

Well, in 1884, Captain A. Allen, of Charleston, W. Va., the same gentleman who pioneered the oil business on Little Kanawha, appeared at Warfield, and leased from Colonel Barrett the oil privileges on 5000 acres, for two years or more, the lease anyhow not to be terminated, except upon thirty days' notice to be given by Colonel Barrett. Captain Allen then went to boring for oil, and struck the grandest reservoir of gas in the world, about 2000 feet down. And there it is, in all its original beauty and strength, doing nobody any good. A gentleman from Louisa, says he can see the light every night, and Louisa is thirty-five miles distant.

Some months ago, Barrett leased or sold the property to the Rigdon Company, which is now trying to organize a corporation of \$20,000,000 capital, to pipe the gas to Cincinnati and the towns between. That company has been working up contracts at Cincinnati and the Ohio river towns to take and use the gas, to the exclusion of other supplies, on the same terms. And now that project, in its financial and practical relations, is being discussed quite extensively in the daily papers.

But there is a new phase to the affair. Captain Allen, the original lessee, disputes the proprietorship of the Rigdon Company, and the power of Colonel Barrett to make a contract. Captain Allen asserts his lease is intact, that he has received no notice of its termination, and for other reasons claims that he is the gas proprietor of that region. At this, Colonel Barrett raises himself in his wrath, and threatens to perforate Captain Allen with very ugly bullets if he doesn't relinquish his pretensions, whereupon Allen swears out a warrant against Barrett to compel the latter to keep the peace, and he is put under bonds of \$5,000. Then, we understand, Barrett does the same thing for Allen, and so the peace of the gas region is under bond, and Warfield is in reality a silent and muttering field of war.

In the meantime, the Rigdon combination are pushing their project, and Cincinnati feels a tremor of excitement. This project moves along with varied success—

the question being on the practicability of piping gas to Cincinnati. The gas engineers look on dubiously. An article in the Cincinnati *Commercial-Gazette* of last Friday regards it as impracticable. The author of that article, whom we happen to know, is a man whose judgment is worth considerable. A few weeks ago, we asked Mr. McMillin, of Columbus, what he thought of the scheme, and he remarked that he didn't believe it could be worked successfully.

The venture is yet in the speculative status, and may never go beyond it. In that event, our manufacturing concerns, which have signed the contracts, will not be seriously disappointed.

Since the above was in type, we learn directly that not only Barrett and Allen are under bond to keep the peace, but Rigdon also. The gas well is in full blaze, and a strong guard is around it day and night. There promises to be a regular war.—*Ironton (O.) Register*, January 30th.

Summary of Daily Pipe Line Runs for January, 1887, and December, 1886.

The following table shows at a glance the pipe line runs for January and December and the increase or decrease from each section. The estimate for Baldridge is based upon the runs of the National Transit Company, which were 1632 barrels in January, and an approximate estimate of the Pittsburgh Pipe Line, which includes all the oil run from Butler county, under one head:

	Jan.	Dec.	Increase.	Decrease.
Allegany.....	1,920	5,072	---	162
Bradford.....	23,133	24,002	---	869
Cherry Grove.....	196	204	---	8
Balttown.....	526	668	---	142
Cooper.....	458	461	---	3
Baldrige, estimated.....	2,800	2,600	200	---
Kane.....	2,957	3,607	---	650
Grand Valley.....	1,619	1,661	---	42
Cogley.....	1,300	1,361	---	61
Tarkill.....	1,500	1,623	---	123
Tipperary.....	179	172	7	---
Red Valley.....	632	675	---	43
Pontius.....	2,313	2,472	---	159
Washington.....	6,930	8,841	---	1,911
Shannopin.....	2,250	3,031	---	781
Smith's Ferry.....	11	14	---	3
Macksburg.....	1,198	1,309	---	111
Other fields.....	10,905	11,393	---	488
Total	63,827	69,166	207	5,546
Total December	69,166	---	---	207
Decrease	5,339	---	---	5,339

In addition to the above the runs of the Buckeye Pipe Line from the Lima field averaged 4226 barrels in January, 4374 barrels in December, 4038 in November and 4112 in October.

January Production Report.

Reports of the stocks on hand at 6002 Bradford wells showed an average increase of .3 barrels to the well during January :

Time.	No. Wells.	Gross Stocks.	Average per well.
January 1, 1887.....	5,993	273,959	45.7
February 1, 1887.....	6,002	275,880	46.0
Difference	9	1,921	.3

The number of wells in the Bradford field connected with the pipe lines on the first of February is estimated at 14,020. Estimating the entire Bradford region on the basis of .3 barrels increase, the total increase in stocks at wells during January was 4206 barrels, a daily average of 136 barrels. Adding the increase in stocks to the total runs as reported by the National Transit and Tidewater pipe lines, Bradford's daily average production for January is as follows:

	Barrels.
Average Daily Pipe Line Runs.....	23,133
Average Daily Increase of Stocks at Wells.....	136
Bradford's January Production, estimated.....	23,269
" December " ".....	22,422
Average Daily Increase.....	847

THE ALLEGANY FIELD.

Stocks reported from about 900 wells in the Allegany field show an increase in every section of the field during January. This increase is equal to an average of nearly five barrels to the well, which gives an average daily increase of stocks of 661 barrels a day. This added to 4902, the average pipe line runs, place Allegany's daily average for January at 5563 barrels. The estimated production for December was 5178 barrels and for November 5860 barrels a day.

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

Field.	No. Wells Jan. 1.	No. Wells Feb. 1.	Average per well Jan. 1.	Average per well Feb. 1.
Clarendon and Tiona	238	239	24	25
Cherry Grove	22	22	44	64
Cooper District	106	106	42	39
Lower Country	127	128	82	72
Miscellaneous	168	178	121	118

Accepting the outside runs, which are made up of the producing fields outside of Bradford and Allegany, as representing the production outside of those two fields, an estimate on the yield for January and December is as follows:

Field.	January. Barrels.	December. Barrels.
Bradford	23,269	22,422
Allegany	5,563	5,178
Outside Runs	34,254	38,783
Total	63,086	66,383
Macksburg	1,343	1,407
Total with Macksburg	64,429	67,790
Decrease per diem		3,361

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region. The runs from Washington are included with the outside field. The Lima runs by the Buckeye Pipe Lines were 4226 barrels a day in January, 4374 barrels a day in December, 4038 barrels in November and 4112 barrels in October.

The following table shows the comparative production for 1884, 1885, 1886 and 1887:

	Bradford.		Allegany.		Outside Runs.		Total Prod.	
	1885.	1884.	1885.	1884.	1885.	1884.	1885.	1884.
January	23,675	31,806	8,260	11,264	18,594	16,140	55,529	59,240
February	27,051	32,378	7,196	11,607	19,800	18,561	54,047	62,546
March	26,444	31,912	7,342	11,768	19,923	19,764	53,709	63,444
April	27,413	32,442	7,169	11,848	23,067	19,162	57,649	63,452
May	27,231	33,922	7,049	11,547	21,225	19,549	55,505	65,018
June	29,272	33,753	7,463	11,108	21,559	19,977	58,294	64,838
July	30,309	34,031	7,139	11,218	19,273	20,870	56,721	66,119
August	29,858	33,353	7,065	10,384	18,608	22,830	55,531	65,507
September	30,205	32,976	7,186	9,877	21,269	22,514	58,660	65,367
October	30,180	31,758	6,747	9,356	23,161	22,762	60,088	63,876
November	31,355	31,789	7,002	8,642	23,087	23,557	61,444	63,988
December	29,223	29,616	6,196	8,193	24,184	22,918	59,603	60,297
	1886.	1885.	1886.	1885.	1886.	1885.	1886.	1885.
January	23,677	28,675	6,378	8,260	22,217	18,594	57,272	55,529
February	28,586	27,051	6,651	7,196	22,603	19,800	57,840	54,047
March	27,947	26,444	6,137	7,342	25,680	19,923	59,764	53,709
April	27,807	27,413	6,527	7,169	28,693	23,067	63,927	57,649
May	27,148	27,231	6,535	7,049	34,515	21,225	68,198	55,505
June	27,860	29,272	6,554	7,463	40,040	21,559	74,454	58,294
July	27,046	30,309	6,350	7,139	40,491	19,273	73,887	56,721
August	26,695	29,858	6,200	7,065	43,762	22,830	76,657	55,531
September	26,674	30,205	5,994	7,186	45,560	21,269	78,228	58,660
October	25,454	30,180	6,017	6,747	45,538	23,161	77,909	60,088
November	24,503	31,355	5,860	7,002	40,817	23,087	71,180	61,444
December	22,422	29,223	5,178	6,196	38,783	24,184	66,333	59,603
	1887.	1886.	1887.	1886.	1887.	1886.	1887.	1886.
January	23,269	28,677	5,563	6,378	34,254	22,217	63,086	57,272

The Macksburg Field in January.

The production of the Macksburg field, estimated from the pipe line runs, the shipments of the West Virginia Transportation Company, etc., averaged about 229 barrels a day for 1884. The gross runs of the Macksburg pipe line since January 1, 1885, with the estimated amount of oil shipped from the field through other

channels is given below. The averages represent the best obtainable figures on the production of the field:

1885.	Macksburg P. L. Runs.	Outside Shipments. Est.	Daily Average Production.
January	11,894	1500	432
February	20,625	1500	790
March	27,067	1500	922
April	40,527	1500	1400
May	48,258	1500	1605
June	64,982	1500	2216
July	75,737	1500	2492
August	74,228	1500	2443
September	68,110	1500	2320
October	63,619	7000	2278
November	60,926	7000	2264
December	61,113	7000	2197
Total	617,086	34,500	1785
1886.			
January	54,806	7000	1994
February	49,694	7000	2025
March	58,795	8973	2156
April	64,137	7890	2401
May	58,596	6630	2104
June	65,379	2871	2275
July	58,410	4080	2016
August	57,492	2790	1945
September	48,918	1240	1672
October	46,937	3240	1619
November	41,359	4090	1515
December	40,578	3040	1407
Total	645,101	58,844	1682
1887.			
January	37,134	4500	1343

In the month of January, 1887, one well was completed in the Macksburg field, with a production of 15 barrels. On the last day of the month there were 3 wells drilling and 7 rigs up and building. During December 5 wells were completed, and on December 31 there were 6 rigs up and building. On January 31 there were 465 producing wells in the Macksburg field, (but at least 40 of these were temporarily stopped) with a total yield of 1343 barrels.

WEST VIRGINIA NOTES.

There were four wells drilling in the Eureka field on January 31. The Mills & Barnsdall was 1368 feet deep. Boss & Brown, No. 2, 1169, Hyland 1630 and Johnson 1650. All these wells have passed the point where the Boss & Brown, No. 1, got its oil and have found nothing. Neither was any oil discovered in the Macksburg sand. The Boss & Brown, No. 1, is said to find its oil in a shale rock and has little significance, as an indicator for a new field, and if oil is found here, it must come from the deeper sands.

SUMMARY of the Statements of the National Transit Company for January and December:

	January. Barrels.	December. Barrels.
Receipts from all sources	1,716,114.89	1,759,855.80
Deliveries	2,048,512.25	2,213,645.81
Gross stocks end of month	33,126,853.96	33,462,850.99
Sediment and surplus	3,424,316.87	2,924,332.53
Total liabilities end of month	29,702,537.11	30,538,518.46
Outstanding acceptances	22,566,039.08	23,881,037.98
Credit balances	7,136,498.01	6,657,480.48

The above "receipts from all sources" for January were made up as follows:

Runs from wells	1,395,510.24
Received from other lines	320,604.65
Received in iron tanks	
Total	1,716,114.89

The above "total deliveries" for January were made up as follows:

Regular shipments	1,988,657.69
Delivered to other lines	59,854.56
Total	2,048,512.25

The above "receipts from all sources" for December were made up as follows:

Runs from wells	1,481,333.84
Received from other lines	278,521.96
Total	1,759,855.80

The above "total deliveries" for December were made up as follows:

Regular shipments	2,154,753.91
Delivered to other lines	58,891.90
Total	2,213,645.81

JANUARY OPERATIONS.

THE ENTIRE REGION—WELLS COMPLETED, WELLS DRILLING, AND RIGS UP AND BUILDING.

WELLS COMPLETED IN JANUARY, 1887.

Allegheny Field.

Twp.	Owner.	Barrels.
Alma, 81,	Shirley & Hochstetter No 9	4
Wirt, 59,	Reynolds & Co	3
" 60,	Surprise Oil Co No 2	3
Clarksville, (Ernhout)	Ackerly, Barton & Co No 23	15

Wells completed	4
Production	25
Dry	0

Bradford Field.*East and West Branches.*

Warrant 2263, Van Vleck & Mitchell	No 40	10
Warrant 2258, R J Straight	No 22	6
Mack, Manufacturers' Gas Co	No 2 (for gas)	gas
Hodgman, Barber & Reynolds		3
Arnot, Wood & Young	No 10	3
Wagner, W C Patterson & Co	No 11	5

Knapp's Creek.

Bradley, Duke Centre Gas Co (for gas)	gas
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Foster Brook.

E T Co, lot 162, E T Co No 42 (second sand)....	5
Lafferty, Van Vleck & Gifford No 57....	10

Indian Creek.

Hamlin, Forest Oil Co	No 40	10
Weston, Murphy, Hogan & Williams	No 12	8
" McKinney & Co	No 7	4
Shattuck, R G Taylor	No 18	8

Kinzua.

Bonanza, Newell & Quigley		5
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Miscellaneous.

Mrs Grador, (Allegheny) Conroy & Johnson	dry
Wells completed	15
Production	77
Dry	3

Warren and Forest.

GLADE AND OTHER TOWNS.

Kinzua Village.

White, Morse & Collins	No 6	25
Weed, "	No 6	25
Willie Run, Smith, Bright & Co	No 5	25
Richardson, T G Phillips		dry
Crandall, Johnson & Co		dry

Clarendon.

55, O W Beatty & Bro	No 54	5
36, Clarendon Mutual Gas Co		gas
56, John O'Neil		5
463, Ed O'Donnell		4
463, Fred Hue	No 2	4
555, Doc Jenkins	No 1	dr
556, J A Waterhouse & Co	No 22	5
556, "	No 23	5
558, Goal Bros	No 1	3

Wells completed	9
Production	31
Dry	2

Tiona.

75, (lot 34) Fertig & McKinney	No 5	6
242, "	No 1	5
200, Bovee & Duck	No 10	5
201, Wesley Chambers	No 16	5
201, Helm & Mealey		6
201, Moore & Co	No 4	6
243, Booth Bros		3
244, Horton, Crary & Co	No 21	6

Wells completed	8
Production	42
Dry	0

Kane.

343, Rathbone & Mallory	No 10	10
345, Clinton & Swayne	No 3	10

3767, Assd Producers & Craig & Cappeau	No 15.....	10
Wells completed.....		3
Production.....		30
Dry.....		0

Grand Valley.

Peterson, Miller & Crippens	No 8	10
Putnam, Wayne Oil Co	No 10	6
150, Nelson Farrell	No 9	8
183, (Cheney) City Oil Co		8
183, (Hatmaker) Phil Serene		10
Anderson, Brown & Co		5
Black, Emery & Skinner		2

Wells completed	7
Production	49
Dry	0

Miscellaneous.

5797, Coast & Sons		dry
2033, Porter, Thyng & Co	No 1	6
36-3, Boyer, Simpson & Co	No 2	6
2033, Boggs, Armstrong & Co	No 2	6
5504, Shannan Syndicate	No 1	dry
Forest Co, (Landers) Dunham & Conrath		15
Wilcox, 5698, Wallace Oil Co		dry

Wells completed	7
Production	33
Dry	3

Lower Country.*Venango and Other Sections.*

Farm.	Operator.	Barrels.
Myers, Oil City Fuel Supply Co		gas
Swarms, "	No 57	gas
McKeever, "	No 60	gas
Stevenson, Lynch Bros & Co		dry
Wallace, Mrs J Wallace		4
McClintock, J H McCandless		dry
Steele, John Waits		5
Columbia, Columbia Oil Co	No 170	10
Morrison, (Salem) Berry, Paul & Co		dry
McCray, Lee & Co		dry
Pleasantville, W P Black		8

Tipperary.

J Fox, E & B F McCracken	No 8	8
M Fox, Judd & Kaufman	No 4	8
Siggins, Taylor, Toirey & Murphy	No 7	5
Henne, Wesley Chambers		dry
Moore, I S Gibson & Dale	No 3	5
T S Hazlett, Deitrich & Warfield		1

Tarkill.

Houser, I H Webb & Co	No 11	20
Houser, A P Dale & Co	No 7	5
Benninger, Columbia Gas Co	No 4	15
" "	No 6	20
" Benninger & Myers	No 4	8
McCalmont, Canning & Goettel	No 9	20
Lloyd lands, Reno Oil Co		dry
Shaunon, Stubler & Co		dry

Vicinity Emlenton.

Kiskadden, Wm Weaver		dry
Jew tract, Johnson & Co		2

Rockland or Red Valley.

Jolly, Leckey & Foster	No 10	20
Hetzler, Morgan & Co	No 8	15
O'Donald, W H H Piper	No 1	10
Batten, Bartlett & McCormick		dry
John P Bishop, Burton & Co		dry

Wells completed	32
Production	189
Dry	13

Clarion.

Bazza, F J Harley & Co	No 1	5
McDowell, Hampton & Co	No 2	10
Smith, (Paint Creek) Smith & Wagner		8
Edmunds, Urquhart & Lavens	No 9	20
Egypt Tract, Eager & Co	No 2	4
Shippin, Jno J Carter	No 6	8
McCleary, McCleary Bros	No 2	gas
Warrant 3674, Barnum & Leasure		dry

Wells completed	8
Production	55
Dry	2

Butler and Armstrong.

Jenny Boyle, Showalter Bros & Hartman		18
Chas Duffey, Branch Creek Oil Co		15
Gillespie, Turner & Sutton		3
Chas Duffey, M Finnegan		5
" "		2
Archy Black, Campbell & Murphy	No 1	dry
Calving, (Widow Croft) Breakneck Oil Co		dry
Wills, Reep & Sutton		10
Butler, (Mrs Edward's farm) Shenango Gas Co (for gas)		dry
Frederick, Geisford & Co	No 3	25
John Boyle, Hartman, Eliason & Co	No 2	5

Critchlow, T W Phillips & Osborne	No 3	5
McCalmont, "	No 13 est	15
S H Critchlow, Wilson, Gahagan & Gihson		75
J W Slater, McLaughlin		dry
Gagens, Taylor & McMartin		dry
Broell, Burchfield & Co		dry
Slater, T W Phillips & D Osborn	No 4	75
Spithaller, "	No 4	100
Heid, "	No 2	275
" A & H Leidecker	No 1	100
" Leidecker Bros	No 3	100

St. Joe.

Bippus, T W Phillips & Osborne		dry
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Martinsburg.

Edmunds, Edmunds & Co	No 2	10
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Thorn Creek.

Maharg, Bolard & Smith	No 4	20
Burton, Thayer & Crosby	No 4	30
Kersting, McClung & Co	No 4	15

Wells completed	27
Production	921
Dry	5

Washington.

Barre, Forest Oil Co	No 8 est	50
" "	No 9	50
Wm Davis, Union Oil Co	No 7	1000
W J Munce, John McKeown	No 11	275
Martin, John McKeown	No 3	350
Clark, Thayer Oil Co	No 6	25
Munce hers, I Willets & Son	No 11	12
" "	No 16	30
" "	No 28	75
Fair Ground, Wheeling Oil Co	No 3	10
Martin, Assd Producers	No 1 est	dry
McKean, Caldwell & Co		10
Pollock, Reed & Co		dry
Manifold, Pew & Emerson	No 3	dry

Wells completed	14
Production	1887
Dry	3

Shoustown.

Chas Eachel, Raccoon Oil Co	No 5	10
" Chas Eachel	No 2	8
Hood, Raccoon Oil Co	No 4	10
A P Morrow, Raccoon Oil Co & Solar Oil		30
" "	No 16	30
" "	No 17	30
" "	No 18	20
Stevenson, Raccoon Oil Co	No 3	35
McAllister, "	No 2	30
Purdy, P M Shannon est		25
Alexander, Lovell & Rumsey est		10
McCoy, Frederick & Calhoun		20
" Reed & Co		40
Baden, Barton & Co		gas
Legi nville, Economites		dry
Robert McCoy, Raccoon Oil Co	No 2	10
John Morrow, "		10
John Aiken, Philadelphia Co est		5
Peter Eachel, Hopewell Oil Co		dry
Anderson, Gailley Bros & Co		gas
Mc utcheon, McDonald Oil Co		dry
Bailey, McNall & Co		dry
Sargents Mills, I Willets & Co		dry

Wells completed	20
Production	293
Dry	4

DRILLING WELLS.

RIGS UP AND BUILDING JANUARY 31, 1887.

Allegheny Field.*Scio.*

Lot.	Owner.	Depth.
3, Coyle & Simon (old)		rig
12, Allen & Morse (old)		rig
12, Griffin & Co No 10 (old)		rig
50, Pease & Coyle No 9 (old)		rig

New rigs	0
Old rigs	4
Drilling	0
Total	4

Alma.

3, M J McMullan & Co	No 5 (old)	rig
23, Vance & Hor on (old)		rig
26, Wi letts & Elliott (old)		rig
26, Wyvill & Miles	No 2	drilling
51, Sawyer & Co (old)		rig
120, McCalmont Oil Co	No 10 (old)	rig

New rigs	1
Old rigs	5
Drilling	0
Total	6

<i>Wirt.</i>	
47, (Voorhees) Applebee & Mix No 2 (old).....	rig
47, (Jas Jordan) McQueen & Thurston No 1.....	sand
48, (Church) McNorton, Deming & Co No 2 (old).....	rig
52, (Jacob Jordan) Wilson & Johnston No 9 (old).....	rig
55, (Orson Witter) P M Shannon & Co No 1 (old).....	rig
61, (Deyoe) National Transit (for gas).....	50
61, (J Jordan) Ackerly, Barton & Co (old).....	rig
61, (Isalah Jordan) Lester, Jordan & Co No 6 (old).....	rig
61, " " No 7 (old).....	rig
62, (Peterson) Limekiln Club No 4 (old).....	rig
62, (Latham) " No 1 (old).....	rig
62, (Peterson) Barton, Hammond & O'Neil No 6 (old).....	rig
Old rigs and shut down.....	10
Drilling.....	2
Total.....	12
<i>Bolivar.</i>	
12, Wood & Co (old).....	rig
23, F C Streeter & Co No 12 (old).....	rig
Old rigs.....	2
Drilling.....	0
Total.....	2
<i>Genesee.</i>	
14, Merwin (old).....	rig
22, I Willets No 14 (old).....	rig
22, " No 15 (old).....	rig
22, " No 16 (old).....	rig
22, " No 17 (old).....	rig
22, " No 18 (old).....	rig
23, Coughlin (old).....	rig
29, William Cranston (old).....	rig
Old rigs.....	8
Drilling.....	0
Total.....	8
<i>Clarksville.</i>	
3, (M Jordan) M Jordan No 3.....	rig
5, (Lane) Lane Oil Co No 6.....	400
5, " " No 7.....	rig bldg
5, (Wetherbee) Harrison, Johnson & Co No 11.....	rig bldg
5, Werthman & Congdon.....	rig
6, (Seever) Ackerly, Barton & Co No 9 (old).....	rig
6, (Hamilton) Ackerly, Barton & Co No 23 (old).....	rig
20, (Ernhout) " (old).....	rig
9, Heuston & Brecht No 4 (old).....	rig
9, Merritt (old).....	rig
20, (Congdon) Clarksville Oil Co.....	drilling
New rigs.....	4
Old rigs.....	5
Drilling.....	2
Total.....	11
<i>Miscellaneous.</i>	
Birdsall twp, I Willets & Co.....	drilling
Sharon, Potter Co, Unknown.....	drilling
Old rigs.....	0
Drilling.....	2
Total.....	2
Bradford Field.	
<i>East and West Branches.</i>	
Warrant 2263, Van Vleck & Mitchell No 41.....	50
" 2263, R J Straight No 23.....	drilling
" 2264, John McKeown No 1.....	100
Dent, P C L & P Co No 75.....	drilling
B O Co, Western Oil Co No 7 (old).....	rig
Mack, Columbia Oil Co (old).....	rig
" Fisher Oil Co No 19 (old).....	rig
" Manufacturers Gas Co No 2 (for gas).....	drilling
Klng, Carmen & Co No 2 (shut down).....	100
Hatfield, Wood & Young No 4.....	rig
Cutting, Booth & Bovard No 1.....	50
Paton, McClure & Co (old).....	rig
Hinchey, McMurray Bros No 6 (old).....	rig
Clark, McCray Bros (old).....	rig
<i>Quintuple.</i>	
25, O H Strong (old).....	rig
44, J W Humphrey (old).....	rig
260, E T Howes (old).....	rig
New rigs.....	1
Old rigs and shut down.....	10
Drilling.....	6
Total.....	17

<i>Knapp's Creek.</i>	
Matthews, C B Whitehead No 6 (old).....	rig
Borden, T P Thompson (old).....	2 rigs
" J S Rogers.....	rig
Duke, J West No 7 (old).....	rig
" " No 8 (old).....	rig
Keating, Forest Oil Co No 54 (old).....	rig
Erskine, Doe & Smith.....	50
Ellis, Dr Chrisman (old).....	rig
Eldred, Elder Bennett.....	drilling
Sprague, Wm Sprague No 1.....	rig bldg
Norton, Mitchell & Jones No 21.....	rig
New rigs.....	3
Old rigs.....	7
Drilling.....	2
Total.....	12
<i>Foster Brook.</i>	
E T Co, Kervin & Co No 10 (old).....	rig
C B & H, Juter & Yager (old).....	rig
" Clark, Cooper & Co No 9 (old).....	rig
" Burns & Monroe (old).....	rig
Lafferty, Van Vleck & Gifford No 58 No 59.....	sand rig
New rigs.....	1
Old rigs.....	4
Drilling.....	1
Total.....	6
<i>Four Mile.</i>	
Van Campen, Coldren & Vance (old).....	rig
" Jas K Van Campen No 3 (old).....	rig
Dye, Manhattan Oil Co No 5 (old).....	rig
New rigs.....	0
Old rigs.....	3
Drilling.....	0
Total.....	3
<i>Indian Creek.</i>	
North Branch, Franchot Bros (old).....	3 rigs
Hamlin, Miller & O'Dell No 4 (old).....	rig
" Forest Oil Co No 41.....	300
Weston, K E Williams No 13.....	rig
Shattuck, Bussell & Johnson No 11.....	drilling
Gale, G N Moore No 11.....	rig
Dodge, T Jennings No 3.....	drilling
New rigs.....	2
Old rigs.....	4
Drilling.....	3
Total.....	9
<i>Cole Creek.</i>	
Warrant 2263, Union Oil Co No 6 (old).....	rig
" 2263, " No 7 (old).....	rig
Bingham, lot 169, Bennett & Thompson No 11 (old).....	rig
" lot 477, Tucker & Rolfe No 3 (old).....	rig
" lot 582, Ass'd Producers No 64.....	rig
" lot 582, " No 65.....	rig
" lot —, C P Byron No 14.....	50
New rigs.....	2
Old rigs.....	4
Drilling.....	1
Total.....	7
<i>Kinzua.</i>	
Guffy & Hulings, Union Oil Co No 69.....	1500
" " No 70.....	rig bldg
New rigs.....	1
Old rigs.....	0
Drilling.....	1
Total.....	2
Warren and Forest.	
GLADE AND OTHER TOWNS.	
<i>Kinzua Village.</i>	
White, Morse & Collins No 7.....	drilling
" " No 8.....	rig
Weed, " No 7.....	400
Willie Run, Smith, Bright & Co No 6.....	drilling
Richardson, T G Phillips.....	drilling
Fuller, P M Smith & Co No 4.....	300
New rigs.....	1
Old rigs.....	0
Drilling.....	5
Total.....	6
<i>Clarendon.</i>	
35, Gray & Nutting No 6.....	drilling
35, Henderson & Murphy.....	rig
77, Waterhouse & Co No 8.....	drilling
105, R J Shugert.....	drilling
105, Tucker & Co (old).....	rig
105, Hackett & Shirley No 6.....	drilling

107, W B Roberts & Son No 20 (old).....	rig
107, J A Waterhouse & Co.....	rig
531, S Short & Son No 16.....	drilling
531, " No 17.....	rig bldg
555, Doc Jenkins No 2 (old).....	rig
556, J A Waterhouse & Co.....	drilling
556, ".....	drilling
556, ".....	rig
558, Goal Bros.....	rig
562, " No 3 (old).....	rig
New rigs.....	5
Old rigs.....	4
Drilling.....	7
Total.....	16
<i>Tiona.</i>	
75, lot 34, Fertig, McKinney & Co No 9.....	drilling
75, lot 34, ".....	2 rigs
161, Ed O'Donnell (old).....	rig
201, Keegan, Sage & Co.....	rig
240, W W Winger No 5 (old).....	rig
244, Horton, Crary & Co No 13 (old).....	rig
244, " No 22.....	drilling
284, Watson & Mitchell No 8 (old).....	rig
324, W W Winger No 2 (old).....	rig
New rigs.....	3
Old rigs.....	6
Drilling.....	2
Total.....	10
<i>Cooper District.</i>	
407, Shank & Stewart No 9 (old).....	rig
407, " No 13 (old).....	rig
2991, (lot 4) Forest Oil Co No 5.....	600
New rigs.....	0
Old rigs.....	2
Drilling.....	1
Total.....	3
<i>Balltown.</i>	
3194, Porcupine Oil Co No 39 (old).....	rig
3195, (Crisman) N F Clark No 14 (old).....	rig
741, Horton, Crary & Co.....	rig bldg
5268, J C Welsh.....	drilling
5268, ".....	drilling
New rigs.....	1
Old rigs.....	2
Drilling.....	2
Total.....	5
<i>Kane.</i>	
343, (Leoker) Ernhart & Co No 1.....	sand
343, " " No 2.....	rig
343, Rathbone & Mallory No 11.....	drilling
344, Treat & Mallory No 6.....	sand
344, " No 7.....	sand
344, " No 8 (old).....	rig
344, " No 9.....	300
420, Coast & Sons No 24 (old).....	rig
3767, Craig & Cappeau No 40 (old).....	rig
3767, Ass Producers & Craig & Cappeau No 16.....	rig
3775, (lot 21) Brenneman & Walker.....	drilling
New rigs.....	2
Old rigs and shut down.....	3
Drilling.....	6
Total.....	11
<i>Grand Valley.</i>	
Blakeslee, Miller & Crippens No 9 (fishing).....	500
Knapp, L B Wood & Co.....	rig bldg
Lot 151, Cadwallader & Co No 2.....	drilling
" 150, Fertig & Lord No 6 (old).....	rig
" 137, G P Kepler & Co (old).....	rig
" 238, J B Jennings & Grandin (old).....	rig
" 345, (Newton) McDonald & Co.....	drilling
Spring Creek, (Hummer) Stewart & Co.....	rig
Lot 133, (Enterprise) Myron Dunham.....	sand
" 183, Phil Serent & Co.....	rig
" 154, Robinson & Cassell.....	drilling
" 135, Emery & Ralston.....	sand
New rigs.....	3
Old rigs.....	3
Drilling.....	5
Total.....	11
<i>Miscellaneous.</i>	
2026, S B Hughes & Co (old).....	rig
2565, C G Thyng (shut down).....	1000
2033, Porter, Thyng & Co No 2.....	rig
4023, Coast & Sons (old).....	rig
Sutton Hill, A F Fritts (old).....	rig
Youngsville, (John Siggins) Scranton Oil Co No 2.....	drilling
Wilcox, (2426) Markham & Co.....	rig
Climax, Ellis & Co.....	rig bldg
<i>Forest County.</i>	
Hickory twp, Taylor & Torrey.....	rig bldg
Howe twp, Shannon Syndicate.....	rig

Harmony, (Rhodes) Dunham & Con-	drilling
" (Irvine) " " " " " "	rig bldg
New rigs.....	6
Old rigs.....	4
Drilling.....	2
Total.....	12

Lower Country.*Venango and Other Sections.*

Allegheny Bank lands, Oil City	drilling
Fuel Supply Co.....	drilling
600 Acres, Oil City Fuel Supply Co.	drilling
McBride, Thomas Smith (old).....	rig
Kaufman, A P Dale No 9 (old).....	rig
Osmer, Galbraith & Parker (old).....	rig
Mt Hope, Dr Galbraith.....	sand
Wallaceville, Phillips Bros.....	sand
Slab Furnace, S P McCalmont (old).....	rig
Main, W J Robinson (old).....	rig
Blood, Wratten & Co (old).....	rig
Columbia, Columbia Oil Co No 171.....	rig
Loots, (2 acres) W H Loots.....	drilling
Plum twp, Ralston & Co.....	rig
Victory twp, Conway Bros.....	drilling
Tract 47, Egypt, J J Fisher.....	drilling
Griffin, James Purtil No 2.....	sand

Vicinity Pleasantville.

Newton, W P Black No 2.....	drilling
Gottschalk, " " " " " "	rig
McGahey, " No 2.....	rig
Sheppard, J Sheppard.....	rig
Sam Fleming, Siggins & Son.....	rig
Black, Emery & Skinner No 5.....	sand

Tipperary.

Moore, Beers & Co No 3 (shut down).....	750
J Fox, " " No 2 (fishing).....	100
Siggins, Taylor, Torrey & Murphy	
No 8.....	100
Saddler, Riddle & Lynch (fishing).....	600
Heckathorn, Phinney & Bishop No 3	sand
No 4.....	rig
M Fox, Sandy Lake Oil Co.....	drilling
Moore, Speechley & Co No 2.....	rig
Wilhelm, Deitrich & Warfield.....	rig
Big Meadow, (Toher) Canning &	
Reese.....	rig bldg

Tarkill.

Houser, I H Webb & Co No 9.....	sand
Houser, A P Dale & Co No 8.....	rig
Benninger, Columbia Gas Co No 7.....	drilling
Kahle, Kahle Bros No 6.....	drilling
Sam Hill, Marks & Shafer No 4.....	drilling
Thompson, Hess, Sackett & Co.....	drilling

Rockland or Red Valley.

Jolly, Leckey & Foster No 11.....	sand
Hetzler, Morgan & Co No 9.....	drilling

Nickleville.

Watson, Watson Bros (old).....	rig
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Vicinity Emlenton.

D Russell, Baum & Co (old).....	rig
W P Grant, J V Ritts (old).....	rig
Sands, Frank Sands.....	rig bldg
Russell, Thos Griffin.....	rig
Wellsby, L M Hale & Co (for gas).....	drilling
Dr Crawford, Wm Weaver No 7.....	drilling

Bullion.

Hovis, Hovis & Co (old).....	rig
Crawford, Hoffman & Co.....	rig bldg
Rankin, Forest Oil Co.....	rig

New rigs.....	15
Old rigs and shut down.....	10
Drilling.....	25

Total estimated.....50

Clarion.

Ber'in, Berlin & Sons No 15 (old).....	rig
John Henel, Koch Oil Co No 8 (old).....	rig
Lloyd, Dr Metzger (old).....	rig
Shreffler, McCulloch & Co (old).....	rig
Wagner & Curl, J V Ritts (old).....	rig
Heasley, Heasley & Co (old).....	rig
Brown, J V Ritts (old).....	rig
Wagner & Curl, Wagner & Hahn	
(old).....	rig
Jones, (Corsica) John Deitrich &	
Yonng (fishing).....	sand
Kable, Berlin & Sons No 2.....	800
Maul, Smith, Yonkers & Corlett.....	sand
Amsler, Ausler Bros No 3.....	200
Paul Black, Clover Bros No 1.....	100
Hunter, Hess, Sackett & Co No 1.....	drilling
Whitehill, Herrington & Co.....	rig
Stumpner, Stumpner Oil Co.....	350
Edmunds Urquhart & Lavens	
No 10.....	rig bldg
Smith, H Wagner.....	rig
Mahle, Baker & Co.....	rig
Shippen, John J Carter No 7.....	rig
Hess, Hess & Sackett.....	rig
McCleary, McCleary Bros No 3.....	rig
Tylersburg, Cook, Leeper & Co No 4	1000

New rigs.....	7
Old rigs.....	8
Wells drilling.....	8

Total.....23

Butler and Armstrong.

Geo Rogers, W S Guffey & Queen.....	sand
F Miller, W G Crawford & Co (old).....	rig
Brownfield, Richard Jennings.....	900
Wm Hickey, Fisher Oil Co No 8.....	1100
" " " " No 9.....	300
O Neil, M P Black & Co No 2.....	800
J Fredrick, Campbell & Co No 2.....	1300
Chas Duffey, Hoch & Co (old).....	rig
Coyle, McBride & Campbell & Fish-	
er Oil Co (old).....	rig
Harmon, Hazelwood Oil Co.....	drilling
Chas Duffey, M Finnegan No 3.....	rig
Fennel, Greenlee & Co.....	1200
Mars, (Belford) R W Miller.....	sand
J Kline, Westerman & Co (old).....	rig
Bredin, Owen, Brady & Co (old).....	rig bldg
Houghon, Forquer Bros No 2 (old).....	rig
Widow O Neil, McBride, Campbell	
& Co.....	800
McKeever heirs, Dennison & Fleg-	
ler (fishing).....	560
McJunkiu, Quilter & Co.....	sand
Malony, Dan Burns.....	300
Hiram Rankin, Thos M Marshall.....	drilling
Harbison, Connors & Fishel.....	drilling
Stefin, T W Fishel & D Osborne.....	1350
Heid, " " " " No 3.....	sand
" " " " No 4.....	1500
" " " " No 5.....	1100
" " " " No 6.....	700
Schaffner, " " " " No 2.....	1450
Markle, " " " " No 3.....	1100
" " " " No 4.....	900
" " " " No 5.....	600
" " " " No 6.....	100
Blakeley, " " " " No 1.....	1000
" " " " No 2.....	900
Galesbaugh, T W Phillips & Henry	
Lenz No 1.....	300
Heid, Leidecker Bros No 3.....	sand
" " " " No 4.....	1400
" " " " No 5.....	900
" " " " No 6.....	650
Blakeley, " " " " No 1.....	1300
John Miller, P Smick (old).....	rig
J Kline, Westerman, Sutton & Co.....	rig
Washington twp, Fletcher farm,	
Armstrong, Campbell & Co. rig bldg	
Friderick, Brady & Simpson No 2.....	300
Barnhart, Vensel & Co.....	800
J Coyle, Bott & Story.....	rig
Gunper, Ward & Stoup.....	rig bldg
Phil Doubenspeck, Shenango Gas Co	
(for gas).....	500
" " " " " " " " " " " "	
Shenango Gas Co	
(for gas).....	rig bldg

St. Joe.

Kelley, T W Phillips & D Osborne.....	rig bldg
Angert, P C L & P Co (fishing).....	1000
Mrs Hasler, Christie & Co (fishing).....	1200

Martinsburg.

Knox, Edmunds & Co.....	drilling
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Thorn Creek.

Bulford, Iman, McBride & Camp-	
bell (fishing).....	1450
Maharg, Bolard & Smith No 3(fishing)	1200
Burton, McBride & Campbell.....	1400
" " " " " " " " " " " "	1000
Thayer & Crosby No 5.....	1400
Hayes, Clark & Co (fishing).....	1400
Girard, M Finnegan No 3.....	sand
Rankin, Farmers' Oil Co.....	rig
Johnson, T W Phillips & Osborne.....	rig
Burton, Shaffer & Co.....	rig
Dixon, Christie & Co.....	rig

New rigs.....	9
Old rigs.....	7
Drilling.....	45

Total.....61

Washington.

Gordon, P L & H Co No 6.....	2350
1 Wilson, Forest Oil Co (old).....	rig
Johnson, " " " " (old).....	rig
Barre, " " " " No 7 fishing	sand
" " " " " " " " " " " "	2000
" " " " " " " " " " " "	1740
" " " " " " " " " " " "	600
" " " " " " " " " " " "	1500
Morgan, Union Oil Co No 7.....	1700
" " " " " " " " " " " "	1300
" " " " " " " " " " " "	950
Workman, " " " " " " " " " " " "	1600
Wm Davis, " " " " " " " " " " " "	1150
Taylor, Union Oil Co No 6.....	sand
" " " " " " " " " " " "	2000
" " " " " " " " " " " "	1500
College Park, Kiskadden & Co (old)	
Parseill, Fisher Oil Co (fishing).....	1200
Wade, B B Campbell & Co No 2 (fish-	
ing).....	1900
Thos McGahey, Mascot Oil Co No 7.....	1100
Lizzie McGahey, " " " " " " " " " " " "	2397
W J Munce, John McKeown No 12	
(fishing).....	1400
" " " " " " " " " " " "	2300
" " " " " " " " " " " "	rig
Martin, John McKeown No 1.....	
" " " " " " " " " " " "	
Montgomery, McKinney & Co.....	

Smith, Willets, Young & Chartiers	
Oil Co No 2.....	2130
Cameron, " " " " " " " " " " " "	1750
" " " " " " " " " " " "	1750
" " " " " " " " " " " "	1100
" " " " " " " " " " " "	250
Fergus, Chartiers Oil Co No 2.....	450
Baker's Station, Dyer & Roberts.....	1575
Munce Heirs, Willets & Son No 6.....	1600
" " " " " " " " " " " "	1700
" " " " " " " " " " " "	sand
" " " " " " " " " " " "	rig
" " " " " " " " " " " "	rig
" " " " " " " " " " " "	rig
" " " " " " " " " " " "	rig
" " " " " " " " " " " "	sand
Coal Center, Hornbake (shut down).....	1100
Martin, Central Oil Co No 2.....	1750
" " " " " " " " " " " "	sand
Linn, Manufacturers' Natural Gas Co	
Wright, Chartiers Oil Co & F W An-	
draws No 4.....	1900
" " " " " " " " " " " "	1500
W Thome, Lee & Shank No 2.....	1950
Whittlesee, Caldwell & Co.....	1800
Watson, Butler & Co.....	sand
" " " " " " " " " " " "	1250
Wiles, C O & G Co.....	900
Rooney, Reed & Co.....	rig
Martin, Allen, Dyer & Co No 1.....	1900
" " " " " " " " " " " "	1200
McNary, Craig & Co.....	800
McKeesport, Stone & Co.....	1200
Cradle Factory lot, Miller.....	rig bldg
McKenna, C O & Gas Co.....	500
Brownsville, Home Natural Gas Co	
(for gas).....	1900
Bellvernon, Schmertz (for gas).....	1000
Monongahela City, Monongahela (for	
gas).....	1000

Taylorstown.

Carson, West Virginia Nat Gas Co..	1950
Noble, " " " " " " " " " " " "	1450
Leech, " " " " " " " " " " " "	200
Blaney, Hart Bros.....	1850
Cundell, Vandergrift & Reed.....	1450
McMannis, Robins & Guffey.....	450
Sheller, Aiken, Stone & Co.....	1100

New rigs.....	6
Old rigs.....	7
Drilling.....	51

Total.....64

Shoustown, Greene County, Etc.

Thos Pinkerton, J S McKelvy (old).....	rig
Charles Eachel, Raccoon Oil Co No 4	
(old).....	rig
A P Morrow, Raccoon Oil Co & Solar	
Oil Co No 19.....	800
" " " " " " " " " " " "	300
" " " " " " " " " " " "	rig
Stevenson, Raccoon Oil Co No 5.....	1200
" " " " " " " " " " " "	rig bldg
Wallace, Raccoon Oil Co No 5.....	1000
Purdy, P M Shannon No 10.....	500
McCoy, Zeigler & Co.....	200
Baden, Barton & Co (for gas).....	drilling
Thos Pinkerton, Union Oil Co.....	1800
Thompson, " " " " " " " " " " " "	500
Davis & Duff, " " " " " " " " " " " "	1600
Good, J M Guffey & Co.....	drilling
Riddle, Philadelphia Co (fishing).....	1000
McGee, Vandergrift & Co.....	1600
James Harper, Hopewell Oil Co old	
Hartman, J M Guffey & Co.....	100
J McLaughlin J W Craig.....	rig
John McConnell, P M Shannon.....	rig
Thornburg, Clinton Oil Co.....	1000
Anderson farm, Nameless Oil Co.....	rig

Greene County and The Southwest.

Fordyce, E M Hukill & Co No 1 (shut	
down).....	1360
Gregg, E M Hukill & Co No 1 (fish-	
ing).....	2275
Garard, E M Hukill & Co No 1 (shut	
down).....	730
Garard, E M Hukill & Co No 2 (shut	
down).....	1060
Hathaway, E M Hukill & Co No 1	
(shut down).....	1000
Mt. Morris, E M Hukill & Co No 1.....	sand
Longanecker, " " " " " " " " " " " "	rig
Ninevah, Johnston & Hamilton.....	1300
Board Tree, Wheeling Natural Gas	
Co.....	1600
McGinnis farm, Wheeling Natural	
Gas Co (shut down).....	800
Sugar Grove, Wheeling Natural Gas	
Co (shut down).....	600
Moundsville, Riggs, J W Craig & Co	
(fishing).....	2000
Sycamore Station, Greene Co, I	
Willets & Co.....	rig
Wade P O, Ohio, Craig, Cappear &	
Co.....	drilling
Bethany, Bateman Goe.....	drilling
Bristoria, Forest Oil Co.....	drilling

New rigs.....	6
Old rigs and shut down.....	3
Drilling.....	17

Total.....26

Recent Publications.

COMMERCIAL ORGANIC ANALYSIS.

A treatise on the properties, modes of assaying, and proximate analytical examination of the various organic chemicals and products employed in the arts, manufactures, medicine, etc., with concise methods for the detection and determination of their impurities, adulterations, and products of decomposition, by Alfred H. Allen, F. I. C., F. C. S. Volume II. Published by P. Blakiston, Son & Co., Philadelphia. Price, \$5.00.

The second volume of Prof. Allen's work on Organic Analysis contains the Chemistry of Fixed Oils and Fats and Hydrocarbons. The latter portion renders it especially valuable to producers, refiners and others who are interested in the scientific side of the petroleum problem. The scope of the work is best shown by the following selections from that part of the table of contents pertaining to the subject of hydrocarbons:

Tabular Arrangement of Hydrocarbons in Series.—Paraffins, olefins, bromine-absorptions of olefins, separation of hydrocarbons.

Destructive Distillation.—Tabular arrangement of products of dry distillation.

Crude Oily Products of Dry Distillation, Tars.—Crude shale oil, blast-furnace tar, wood tar, coal tar, tabular view of the constituents of coal tar, assay of pitch.

Crude Hydrocarbons of Mineral Origin, Bitumens.—Petroleum, assay of crude petroleum, ozokerite, asphaltum, assay of asphalt.

Petroleum and Shale Products.—Composition of products, bromine-absorptions, mineral naphtha, mineral burning oil, flashing point of kerosene, mineral lubricating oils, vaselene, paraffin wax, paraffin scale, petroleum residues.

Benzene and its Homologues.—Benzene, thiophene-nitrobenzene, toluene, Xylenes, coal tar naphtha, assay of commercial benzols and naphthas, fractional distillation of benzols, etc.

Naphthalene and its Derivatives.—Naphthalene, naphthalene oils, naphthols, dinitro-naphthol.

THE OFFICE.

Among the articles in the February issue of *The Office*, which is at hand, are the following: "The Growth of Corporate Business," "Installment Leases and Contracts," "Business Education," and "The Advantages of Accounts of Cost." "The Management of Scrap, books" is also happily treated. The proceedings of several accountants' societies are given, including the Bookkeepers' Association of Philadelphia, the Chartered Accountants of Ontario, the Office Men's Club of St. Louis, the Institute of Accounts, New York, the Boston Association, and the Office Men's Club of Columbus. Some particulars are also presented concerning a new organization among expert accountants, to be known as "The American Association of Public Accountants." In the Department of Correspondence there are presented a large number of letters on various topics that are of interest to accountants and business managers generally. *The Office* is published from No. 205 Broadway, New York.

New Oil and Gas Incorporations.

The Manufacturers' Gas Company, of Bradford, has been incorporated with a capital stock of \$50,000. The principal stockholders are James Broder, John H. Markham, Bovaird & Seyfang, T. N. Barnsdall.

The Quenemo Natural Gas and Coal Company, of Quenemo, Kan., has been incorporated with a capital of \$10,000. Messrs. George B. Jenness, E. Fuller, J. S. Cloud, J. C. Rankin, and others, are incorporators.

The Citizens' Gas Company, of Bowling Green, Ky., has been incorporated. Incorporators named are Albert E. Royce, J. J. Coon, Wm. R. Noyes, Milton Taylor, Guy G. Mayer, A. J. Manville. Capital stock, \$100,000.

The Pana Natural Gas Company is drilling a well at Pana, Illinois.

The Natural Gas Illuminating and Heating Company, of Pittsburgh, has been organized with the following officers: President, James W. Drape; Secretary and Treasurer, S. A. Clark. The capital stock is limited for a time to \$12,000, but may be increased to \$150,000. The aim for the present is to prosecute the carburetting of natural gas for lighting purposes. The company's office is at No. 94 Fourth avenue, Pittsburgh.

The Natural Gas and Oil Development Company, of Columbus, Ohio, has filed articles of incorporation. Incorporators are: W. S. Thurstin, C. M. Hayden, R. D. Whittlesly, J. E. Bailey, George Brooman, J. E. Parsons, W. R. Woodford. Capital, \$50,000.

Runs, Shipments and Stocks.

RUNS OR RECEIPTS.

PIPE LINE.	JAN., 1887.	DEC., 1886.
National Transit Co.....	1,395,510.24	1,481,333.84
Tidewater.....	186,466.74	187,241.39
Octave Oil Co.....	2,469.00	2,872.23
Excelsior Pipe Line.....	34,380.98	23,855.95
Pittsburgh Pipe Line.....	42,157.62	41,005.08
Southwest Pennsylvania.....	280,526.27	367,246.55
Total.....	1,941,510.85	2,103,555.04
Daily average.....	62,629.38	67,856.61

In the above runs only the oil received by the National Transit Co. directly from the wells, is included.

DELIVERIES OR SHIPMENTS.

PIPE LINE.	JAN., 1887.	DEC., 1886.
National Transit Co.....	1,988,657.69	2,154,753.91
Tidewater.....	168,401.06	241,736.92
Octave Oil Co.....	1,755.30	3,171.65
Excelsior Pipe Line.....	34,535.36	29,676.83
Pittsburgh Pipe Line.....	40,463.00	43,645.91
Southwest Pennsylvania.....	298,092.26	258,486.87
Total.....	2,531,904.67	2,731,472.09
Less oil transferred between lines.....	320,604.65	278,521.96
Total.....	2,211,300.02	2,452,950.13
Daily average shipments.....	71,332.26	79,127.42

In the above shipments only the oil delivered to refiners is included.

Daily excess of shipments over runs, January, 1887.....	8,702.88
Daily excess of shipments over runs, December.....	11,270.81
Daily excess of shipments over runs, November.....	10,818.54
Daily excess of shipments over runs, October.....	580.75
Daily excess of runs over shipments, September.....	8,057.13
Daily excess of runs over shipments, August.....	11,931.56
Daily excess of runs over shipments, July.....	5,557.20
Daily excess of runs over shipments, June.....	4,793.41
Daily excess of runs over shipments, May.....	3,967.06
Daily excess of shipments over runs, April.....	4,899.20
Daily excess of shipments over runs, March.....	4,561.80
Daily excess of runs over shipments, February.....	14,701.52
Daily excess of shipments over runs, January, 1886.....	7,825.68

NET STOCKS.

PIPE LINE.	JAN. 31, 1887.	DEC. 31, 1886.
National Transit Co.....	29,702,537.09	30,538,518.46
Tidewater.....	1,443,538.64	1,369,422.03
Octave Oil Co.....	3,954.00	4,039.34
Excelsior Pipe Line.....	14,350.38	14,504.76
Pittsburgh Pipe Line.....	5,712.87	4,048.25
Southwest Pennsylvania.....	1,000,550.99	1,018,116.98
Total.....	32,170,673.97	32,948,649.82
Stocks decreased January, 1887.....		777,975.85
Stocks decreased December.....		357,196.56
Stocks decreased November.....		286,526.86
Stocks decreased October.....		1,790.72
Stocks increased September.....		214,073.99
Stocks increased August.....		362,652.56
Stocks increased July.....		188,510.62
Stocks increased June.....		216,583.97
Stocks increased May.....		110,800.44
Stocks decreased April 1886.....		165,635.61

RECEIPTS. DELIVERIES.

Daily average January, 1887.....	62,629	71,332
Daily average December.....	67,857	79,127
Daily average November.....	70,767	81,586
Daily average October.....	76,019	76,600
Daily average September.....	77,989	69,932
Daily average August.....	76,880	64,949
Daily average July.....	74,880	69,323
Daily average June.....	75,811	71,017
Daily average May.....	68,602	64,635
Daily average April 1886.....	64,228	69,127

NOTE—The above figures are in barrels of 42 gallons each, and include only the pipe lines of the New York and Pennsylvania oil regions.

1860.

1886.

THE TIFFT ENGINES AND BOILERS.

Honest, Reliable and Economical. Over 7,000 in use.

Superior in finish and completeness to all others. Prices as low as any standard machinery.

Address,

Geo. W. Tift, Sons & Co.,
BUFFALO, N. Y.

Or **A. McLEAN**, General Manager, Branch Office, Bradford, Pa.

W. H. DUFUR, Chairman.

JAS. B. BERRY, Secretary and Treasurer.

THE ASTRAL REFINING CO., LIMITED.

Refiners and Producers of Petroleum,

ALL QUALITIES OF

Illuminating, Lubricating Oils, Naphthas and Gasoline,

OIL CITY, PENN'A.

Manufacturers of "Water White Astral Oil," 48 to 49 Gravity, 50 Fire Test.

B. B. CAMPBELL, CHAIRMAN.

B. P. CRAWFORD, TREASURER.

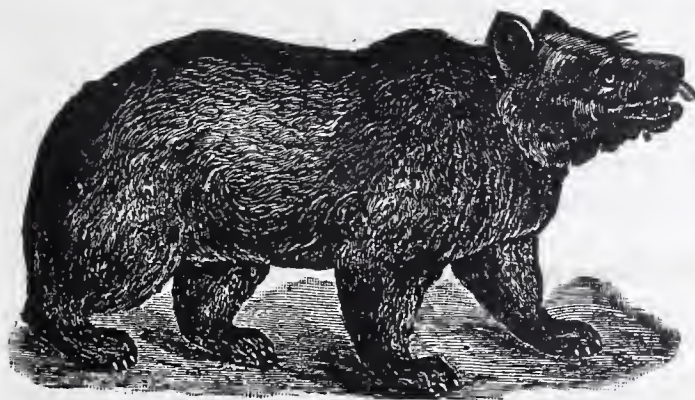
BEAR CREEK REFINING CO., (LIMITED.)

REFINERS

OF THE BEST

Illuminating Oils

MADE.



BRANDS :

URSOLEUM—Strictly water white, 48° gravity, or better, fire test, 150°.

RAILROAD.—Water white, 47° gravity, fire test, 150°.

BEAR CREEK — Standard white, 46° gravity, fire test, 110°.

Gasolines and Deodorized Benzines of excellent quality and all gravities.

REFINERY, COLEMAN STATION, A. V. R. R. OFFICE, COR. 11TH & ETNA STS., PITTSBURG, PA.

VICK'S

FLORAL GUIDE.

If you are in want of Garden, send 10 cts. or anything for the SEEDS for above, which can be deducted from the first order.
JAMES VICK, SEEDSMAN,
 ROCHESTER, N. Y.

W. & W. R. R. TIME TABLE.

DECEMBER 27, 1886.

NORTHWARD		STATIONS.	SOUTHWARD	
No. 3	No. 1		No. 2	No. 4
P. M.	A. M.		A. M.	P. M.
2 00	6 00	Lv.....Waynesburg.....Ar	10 35	6 25
2 15	6 15	.....Sycamore.....	10 17	6 07
2 23	6 23	.....Swart.....	10 09	5 59
2 30	6 30	.....Deer Lick.....	10 02	5 52
2 38	6 38	.....West Union.....	9 53	5 43
2 47	6 47	.....Dunn.....	9 43	5 33
2 50	6 50	.....Linley's Mills.....	9 40	5 30
3 01	7 02	.....West Amity.....	9 28	5 18
3 06	7 08	.....Luellen.....	9 22	5 12
3 11	7 13	.....Baker.....	9 17	5 07
3 14	7 20	.....McCracken.....	9 13	5 00
3 27	7 35	.....Vaukirk.....	9 00	4 47
3 40	7 50	.....Braddock.....	8 48	4 33
3 55	8 05	Ar.....Washington.....Lv	8 35	4 20
6 36	9 55	Ar.....Pittsburg.....Lv	6 10	1 55
P. C. & St. L. R.R.				

Time given above is Central Standard, which is 40 minutes slower than Pittsburg or local time, or one hour slower than Eastern time.

The Company reserve the right to vary from this schedule as circumstances may require. All trains daily except Sunday.

C. E. BOWER, Superintendent.

Are you Contemplating a Trip

EAST OR WEST?

If so, bear in mind the fact that the

CHICAGO & ATLANTIC,

With its Palatial Equipment of PULLMAN DAY COACHES and LUXURIOUS SLEEPING CARS, offers to the Public Advantages which cannot be excelled by competing lines.

All classes of travel have through trains, thus avoiding the discomfort of changing cars at unseasonable hours.

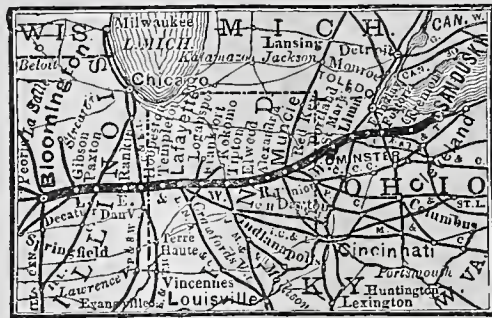
Information regarding rates, through baggage checks, tickets, etc., can be had from any coupon ticket office.

Ask for your tickets via the **Chicago & Atlantic Railroad** and your journey will be one of comfort and pleasure.

F. C. DONALD,
 General Passenger Agent.

F. BROUGHTON,
 General Manager.

LAKE ERIE & WESTERN R'Y.



THE SHORT LINE BETWEEN THE EAST & WEST.

The shortest and most direct route, making immediate connections for passengers east and west.

CONDENSED TIME OF THROUGH TRAINS.

SEPTEMBER 20, 1886.

WESTWARD.		CENTRAL TIME.		EASTWARD	
		I. C. Ry			
10 15 p m	9 50 a m	Ar.....Sioux City.....Lv	4 50 p m	7 50 a m	
7 40 a m	7 45 "	".....Dubuque....."	6 30 a m	9 50 p m	
2 18 "	9 15 a m	Lv.....Bloomington.....Ar	3 17 p m	8 20 a m	
		I B & W. R'y			
9 20 a m	7 15 p m	Ar.....Council Bluffs.....Lv	6 00 p m	9 10 a m	
8 40 p m	6 20 a m	.....Burlington.....	2 35 p m	10 30 p m	
5 10 "	7 45 a m	.....Peoria.....	7 10 p m	6 45 a m	
2 55 "	5 20 a m	Lv.....Bloomington.....Ar	9 25 p m	9 10 a m	
		C & A Ry			
7 10 p m	7 00 a m	Ar.....Omaha.....Lv	9 05 p m	7 50 a m	
12 25 p m	1 00 p m	.....St Joseph.....	2 45 p m	3 00 p m	
11 55 a m	11 55 p m	.....Atchison.....	3 15 a m	3 20 p m	
8 50 "	9 15 "	.....Kansas City.....	6 00 a m	6 45 p m	
5 50 p m	6 30 a m	Lv.....Bloomington.....Ar	9 00 p m	8 55 a m	
		C & A Ry			
7 45 p m	7 45 a m	Ar.....St. Louis.....Lv	7 55 p m	7 50 a m	
1 45 "	2 10 a m	Lv.....Bloomington.....Ar	2 10 a m	1 45 p m	
		L. E. & W. Ry.			
1 25 p m	1 35 a m	Ar.....C & A Junc.....Lv	2 20 a m	9 20 a m	
1 15 "	1 25 a m	.....Bloomington.....	2 30 "	9 30 a m	
11 40 a m	11 58 p m	.....Gibson.....	4 02 "	10 51 a m	
11 02 "	11 18 "	.....Paxton.....	4 38 "	11 24 a m	
10 10 "	10 20 "	.....Hoopeston.....	5 34 "	12 30 p m	
9 10 "	9 20 "	.....Templeton.....	6 38 "	1 24 "	
8 25 "	8 25 "	.....LaFayette.....	7 45 "	2 20 "	
8 04 "	8 04 "	.....LaFayette Junc.....	7 52 "	2 25 "	
7 04 "	7 2 "	.....Frankfort.....	8 53 "	3 16 "	
6 08 "	6 02 "	.....Tipton.....	9 55 "	4 10 "	
5 36 "	5 38 "	.....Elwood.....	10 21 "	4 32 "	
5 15 "	5 17 "	.....Alexandria.....	10 42 "	4 51 "	
4 35 "	4 35 "	.....Morie.....	11 35 "	5 45 "	
3 46 "	3 42 "	.....Red Key.....	12 15 p m	6 25 "	
3 18 "	3 13 "	.....Portland.....	12 42 "	6 20 "	
2 14 "	2 07 "	.....Celina.....	1 44 "	7 52 "	
1 50 "	1 42 "	.....St Mary.....	2 07 "	8 13 "	
12 45 "	12 45 "	Lv.....Lima.....Ar	3 05 "	9 15 "	
12 35 "	12 25 "	Ar.....Lima.....Lv	3 15 "	9 25 "	
12 00 p m	11 49 a m	Lv.....Bluffton.....Ar	3 48 "	10 02 "	
11 21 "	11 12 a m	.....Findlay.....	4 25 "	10 88 "	
11 00 "	10 52 a m	.....Arcadia.....	4 46 "	11 00 "	
10 43 "	10 37 a m	.....Fostoria.....	5 00 "	11 15 "	
10 10 "	10 07 a m	.....Burgoon.....	5 32 "	11 44 "	
9 45 "	9 45 a m	.....Fremont.....	6 05 "	12 10 a m	
8 40 p m	8 45 a m	.....Sandusky.....	7 00 "	1 00 "	
		P. F. W. & C. R'y			
11 10 p m	9 50 a m	Ar.....Lima.....Lv	4 10 p m	4 40 p m	
7 05 p m	10 10 a m	Lv.....Crestline.....Ar	1 15 p m	7 55 p m	
12 40 "	11 15 p m	.....Pittsburgh.....	5 30 a m	3 35 a m	
3 10 a m	3 40 p m	.....Harrisburg.....	1 55 p m	3 20 p m	
11 30 p m	10 55 a m	.....Baltimore.....	5 00 p m	6 50 p m	
11 20 "	11 50 a m	.....Philadelphia.....	4 45 p m	9 35 p m	
8 00 p m	9 00 a m	.....New York.....	6 55 p m	6 50 p m	
		L S & M S R'y			
9 42 p m	8 40 a m	Ar.....Sandusky.....Lv	6 32 p m	6 05 a m	
6 40 "	6 30 a m	Lv.....Fremont.....Ar	9 40 p m	8 25 a m	
11 55 a m	11 55 p m	.....Buffalo.....	3 30 a m	2 45 p m	
2 15 "	3 00 p m	.....Albany.....	2 20 p m	2 00 a m	
9 15 p m	10 30 a m	.....New York.....	7 00 p m	7 00 a m	
7 00 "	8 30 a m	Lv.....Boston.....Ar	9 45 p m	6 35 a m	

Through tickets on sale to all important points. For information in regard to tickets, rates, &c. inquire of Ticket Agents at principal ticket offices, or address,

G. W. SMITH,
 Gen'l Pass, Agent,
 BLOOMINGTON, ILL.

MAPS OF THE VARIOUS OIL FIELDS FOR SALE BY

McMULLEN, SNEEL & ARMOR, Bradford, Pa.

THE PETROLEUM AGE.

Buffalo, New York & Philadelphia R. R. THE NEW SHORT LINE TO SUNBURY, WILLIAMSPORT, HARRISBURG PHILADELPHIA, BALTIMORE, WASHINGTON, AND ALL POINTS SOUTH.

Leave Buffalo at 8:00 a. m. (except Sunday) arriving at Olean at 11:00 a. m. Connects at Olean for Bradford. Arriving at 12:45. Train leaves Buffalo at 3:00 p. m. (except Sunday) arriving at Olean at 6:00 p. m., connecting at Olean for Bradford; at Port Allegany for Coudersport; at Emporium with P. & E. R. R. for St. Marys, Ridgway, Kane, Harrisburg, Philadelphia, Baltimore, Washington and the South.

Train leaves Buffalo at 5:20 p. m. (daily) arrives at Olean at 8:20 p. m.

Train for Buffalo leaves Olean at 5:45 (daily) and 10:45 a. m. (except Sunday) arriving at Buffalo at 8:40 a. m. and 1:25 p. m.

Afternoon train leaves Olean at 4:00 (except Sunday) arrives at Buffalo at 7:00 p. m.

GEO. S. GATCHELL, Gen'l. Superintendent. J. A. FELLOWS, Gen'l. Pass. and Ticket Agent.

NARROW GAUGE DIVISION, BRADFORD & OLEAN.

EASTWARD.				Dec 12, 1886.				WESTWARD.			
Sun.	Exp.	Mail.	Exp.	Eastern Time.				Exp.	Mail.	Exp.	Sun.
A. M.	P. M.	P. M.	P. M.	Ar. Richburg	Lv.	A. M.	A. M.	P. M.	P. M.	P. M.	P. M.
7 25	8 58	3 55	7 15	" Bolivar	"	5 45	9 10	2 13	7 20	11 00	6 05
11 00	6 00	3 55	8 58	" Olean	"	7 20	11 00	6 05	3 30	7 50	5 18
9 15	4 15	2 15	7 15	Lv. Bradford	Ar.	9 00	12 45	7 50	5 18		
A. M.	P. M.	P. M.	A. M.			A. M.	P. M.	P. M.	P. M.	P. M.	P. M.

BETWEEN ELDRED AND BRADFORD.

Exp.	Exp.	Exp.	Eastern Time.				Exp.	Exp.	Exp.
P. M.	P. M.	A. M.	Ar.	Eldred	Lv.	A. M.	A. M.	P. M.	P. M.
5 10	2 55	8 30	"	Duke Centre	"	7 10	11 37	3 25	3 51
4 50	2 29	8 12	"	Tarport	"	8 25	12 50	5 09	5 15
3 55	1 16	7 15	Lv.	Bradford	Ar.	8 30	12 55	5 15	
3 50	1 10	7 10				A. M.	P. M.	P. M.	P. M.
P. M.	P. M.	A. M.				A. M.	P. M.	P. M.	P. M.

30 Miles Saved by the New BRADFORD SHORT LINE,

Between Olean, Bradford, Warren and the Lower Oil Fields. Two fast Express Trains each way, daily except Sunday.

CONDENSED SCHEDULE OF THROUGH TRAINS.

EASTWARD.			Dec 12, 1886.			WESTWARD.		
Exp.	Acc.	Exp.	Eastern Time.			Acc.	Exp.	Exp.
P. M.	P. M.	A. M.				A. M.	A. M.	P. M.
8 00	3 25	11 25	Ar	Bradford	Lv	7 00	9 15	4 20
6 20	12 45	9 40	Lv	Kinzua	Ar	9 15	11 00	6 00
P. M.	P. M.	A. M.				A. M.	A. M.	P. M.
5 30		9 05	Lv	Warren	Ar		11 50	6 49
5 00		8 45	"	Irvinton	"		12 10	7 10
4 25		8 10	"	Tidioute	"		12 43	7 40
3 05		6 50	"	Oil City	"		2 05	9 05
9 00		8 50	Lv	Pittsburgh	Ar		7 20	7 35
A. M.		P. M.					P. M.	A. M.

J. A. FELLOWS, Gen. Pass. and Ticket Agent, Buffalo, N. Y.

Buffalo, Rochester & Pittsburgh R. R. BUFFALO AND ROCHESTER DIVISION.

Dec. 19, 1886—Eastern Time.

STATIONS.							
P. M.	A. M.	P. M.	A. M.	Ar.	Lv.	A. M.	P. M.
7 30	11 00	8 40	5 00	Ar. Buffalo	Lv.	8 40	5 00
3 18				" Rochester	"		7 50
2 40	8 00	12 30	8 00	Lv. Bradford	Ar.	12 30	8 00
5 00				" do	Lv.	12 55	3 26
	2 15			" Ridgway	"		4 55
	11 40			" Falls Creek	"		5 02
	9 56			" Dubois	"		6 08
	9 50			Punxsutawney	Ar.		
	8 40			Lv.	Ar.		
	A. M.						

Thousand Mile Tickets sold at Two Cents per mile.

Connections made at Salamanca with the N. Y., P. & O. R. R. for all points West and Southwest; also with the Erie R. R. for all Eastern points; at Bradford with the Narrow Gauge system to all points in the Oil Regions.

JAS. T. GARDNER, Sup't. I. S. EMERY, Gen. Pass. Agt.

Warren and Farnsworth Valley Railroad.

Narrow Gauge Railroad to Garfield, Vandergrift and Dunham's Mills.

Clarendon, Lv. 10 35 5 10 Garfield, Lv. 7 20 3 15
Garfield, Ar. 11 35 6 10 Clarendon, Ar. 8 20 4 15

Trains are run on P. & E. R. R. time. Passengers can leave Oil City and Titusville for Garfield by morning train, remain three and one-half hours in Garfield and return same evening.

A. D. WOOD, General Manager.

THE ERIE NARROW GAUGE SYSTEM.

BRADFORD, BORDELL & KINZUA

AND

Bradford, Eldred & Cuba Railroad.

November 25, 1886.

WESTWARD.			STATIONS.		EASTWARD.		
Exp.	Exp.	Mail.	Ar.	Lv.	Exp.	Mail.	Exp.
A. M.	P. M.	A. M.			A. M.	P. M.	A. M.
9 25	5 15	11 15	Ar. Bradford	Lv.	7 40	3 10	7 00
8 50	4 40	10 40	" Kinzua Junction	"	8 20	3 50	7 40
8 43			" Aiken	"			7 47
8 29			" Simpson	"			8 01
7 40			Lv. Smethport	Ar.			8 45
	4 32	10 30	" Rew City	"	8 28	3 56	
	4 12	10 05	" Rixford	"	8 46	4 12	
	4 07	10 00	" Duke Centre	"	8 51	4 17	
	3 48	9 40	" Eldred	"	9 10	4 35	
	3 32	9 25	" Bullis Mills	"	9 25	4 50	
	3 17	9 09	" Ceres	"	9 41	5 06	
	3 04	8 55	" Little Genesee	"	9 55	5 20	
	2 55	8 45	" Bolivar	"	10 05	5 30	
	2 34	8 21	" Allentown	"	10 29	5 54	
	2 05	7 50	" Wellsville	"	11 00	6 25	
			" Kane	"			
A. M.	P. M.	A. M.			A. M.	P. M.	A. M.

Trains for Kane leave Bradford at 7.00 and 10.00 a. m. and 5.00, arriving at Kane at 9.30 a. m. and at 12.30 and 7.40 p. m. Trains leave Kane at 6.50 and 9.55 a. m., arriving at Bradford at 9.25 a. m. and 5.00 p. m.; arriving at Bradford at 2.45 p. m. and 5.10 p. m. arriving at Bradford at 7.55.

Additional trains leave Bradford for Smethport at 10.00 a. m. and 5.10 p. m. Returning, leave Smethport at 1.00 and 5.50 p. m.

JOHN C. MCKENNA, Superintendent.

WHEELING AND LAKE ERIE

And Cleveland and Marietta R. R's.

Time Table—In effect Nov. 1, 1886.

Central Standard Time.

EASTWARD.		No. 5.	No. 7.	No. 9*	No. 1*
Toledo	Lv.	7 45a. m.	12 30p. m.	4 45p. m.	
Oak Harbor	Ar.	8 43	1 22	5 38	
Fremont		9 07	1 47	6 02	
Clyde		9 23	2 03	6 18	
Bellevue		9 38	2 18	6 32	
Monroeville	Lv.	9 57	2 32	7 01	1 35a. m.
Norwalk		10 13	2 50	7 20	1 50
Wellington		11 03	3 45	9 00	2 32
Creston	Ar.	11 52	4 33	10 45	3 15
Orrville	Ar.	12 20p. m.	5 05	11 45p. m.	3 45*
Orrville	Lv.	12 40	5 05	6 00a. m.	6 00
Massillon	Ar.	1 20	5 45	6 40	6 40
Massillon	Lv.	1 20	5 45	6 40	6 40
Bowerston	Ar.	2 55p. m.	7 35p. m.	9 40a. m.	9 40a. m.
Canal Dover		2 34p. m.	7 02p. m.	11 30a. m.	11 30a. m.
Newcomertown		3 13	7 46	12 09p. m.	12 09p. m.
Cambridge		4 08	8 37	1 02	1 02
Macksburg		5 39		2 30	2 30
Marietta	Ar.	6 55p. m.		3 38	3 38
WESTWARD.		No. 6.	No. 8.	No. 4.	No. 2*
Marietta	Lv.	7 00a. m.	11 00p. m.		
Mucksburg		8 18	12 05		
Cambridge		9 52	1 27	5 30a. m.	
Newcomertown		10 47	2 20	6 20	
Canal Dover		11 30a. m.	2 54p. m.	6 55	
Bowerston		11 55a. m.	3 30p. m.	6 30a. m.	
Massillon		1 20p. m.	7 10	8 15	
Orrville	Ar.	1 55	8 20	8 55	
Orrville	Lv.	2 00	10 15*	8 55	
Creston	Lv.	2 30	10 45	9 25	
Wellington		3 18	11 28	10 12	
Norwalk		4 10	12 10	11 25	7 25a. m.
Monroeville		4 22	12 25a. m.	11 37	7 37
Bellevue		4 40	*	11 55	7 53
Clyde		4 56		12 10p. m.	8 08
Fremont		5 13		12 30	8 25
Oak Harbor		5 41		12 55	8 48
Toledo	Ar.	6 35p. m.		1 55p. m.	9 45a. m.
No. 29.	No. 27.	NORWALK & HURON.		No. 26.	No. 28.
5 15p. m.	11 40a. m.	Ar.	Huron	Lv.	6 25a. m.
4 30p. m.	10 45a. m.	Lv.	Norwalk	Ar.	7 15a. m.
					3 00p. m.

* Daily.

This road is now open through from Toledo to Bowerston, connecting with the Pennsylvania System for all points East.

THROUGH CAR SERVICE—Between Toledo, Cambridge and Marietta; Toledo and Bowerston; Toledo and Akron, Youngstown and Pittsburgh; Chicago, Akron, Youngstown and Pittsburgh.

M. D. WOODFORD, General Manager.

JAMES M. HALL, Gen'l. Pass. Agent.

THE PETROLEUM AGE.

The PITTSBURG & WESTERN RAILROAD Time Table

IN EFFECT OCT. 11th, 1886.

Central Standard Time, one hour slower than Eastern Time.

NORTHERN DIVISION.					
SOUTHBOUND TRAINS.					
STATIONS.			25	17	
Bradford.....Lv.		P. M.	A. M.	A. M.	
				8 15	
.....Lv.					
Kane.....				10 46	
Sheffield Junction.....				11 40	19
Marienville.....				12 20	P. M.
Tylersburg.....				1 00	
Clarion Junction.....			7 00	1 40	4 00
Clarion.....			6 30	1 15	3 30
Shippenville.....	23		7 12	1 53	4 14
Knox.....			7 30	2 08	4 33
St. Petersburg.....			8 20	2 43	5 20
Foxburg.....	A. M.		8 50	3 25	5 40
Parker.....	5 50		9 00	3 42	
Bruin.....	6 08	P. M.	9 20	4 02	P. M.
Petrolia.....	6 18		9 32	4 15	
Karns.....	6 22	27	9 38	4 20	9
Millerstown.....	6 36		9 55	4 38	
St. Joe.....	6 50	A. M.	10 08	4 53	P. M.
Butler.....	7 20	8 38	10 40	5 40	1 55
Renfrew.....	7 41	8 55	11 00	6 00	2 11
Callery Junction.....	8 10	9 20	11 25	6 25	2 35
Allegheny.....Ar.	10 30	10 30	12 40	7 35	3 58
	A. M.	A. M.	P. M.	P. M.	P. M.

NORTHBOUND TRAINS.					
STATIONS.	4	8	18	24	26
Allegheny.....Lv.	A. M.	A. M.	A. M.	P. M.	P. M.
	6 00	9 20	7 20	1 46	5 35
Callery Junction.....	7 30	10 40	8 35	3 10	6 50
Renfrew.....	7 58	11 00	8 55	3 34	7 12
Butler.....	8 20	11 20	9 16	3 55	7 33
St. Joe.....			9 45	4 25	8 00
Millerstown.....		A. M.	10 30	4 38	8 14
Karns.....			10 15	4 54	8 28
Petrolia.....		20	10 20	5 00	8 32
Bruin.....			10 32	5 10	8 43
Parker.....		A. M.	10 52	5 28	9 00
Foxburg.....		6 25	11 25	6 00	9 10
St. Petersburg.....		6 44	11 40	6 16	
Knox.....		7 44	12 24	7 02	
Shippenville.....		8 06	12 41	7 20	
Clarion Junction.....		8 24	12 55	7 30	P. M.
Clarion.....		9 00		8 00	
Tylersburg.....			1 30		
Marienville.....			2 08		
Sheffield Junction.....			2 50		
Kane.....Ar.			3 50		
Bradford.....Ar.			6 25		
	A. M.		P. M.	P. M.	

Westbound trains leave Callery Junction as follows:
 Cleveland and Toledo Express 8.35 a. m., New Castle Accommodation 3.10 p. m., Chicago Express, with through Sleeping Car, 4.38 p. m., Zelenople Accommodation 6.50 p. m.
 No. 17 makes direct connection at Allegheny with B. & O. R. for Washington and Baltimore.
 No. 19 connects at Foxburg with A. V. R. R. for Franklin and Oil City.
SUNDAY TRAINS Nos. 23 and 26 will run daily. Nos. 18 and 17 will run daily between Butler and Allegheny. No. 23 connects at Callery Junction for Allegheny and New Castle. No. 26 gets connections from Allegheny and New Castle. All other trains run daily, except Sunday.
THOS. M. KING, General Manager.
C. W. BASSETT, General Passenger Agent.

Pittsburgh & Lake Erie R. R. Time Table.

IN EFFECT MAY 10, 1886.

[Read Down.]	Central Time.	[Read Up.]
5 00a.m.	8 15a.m.	Bradford.....
5 30a.m.	10 55a.m.	Salamanca.....
6 45a.m.	11 55a.m.	Jamestown.....
9 20a.m.	2 20p.m.	Meadville.....
10 55a.m.	5 40p.m.	Youngstown.....
12 52p.m.	7 30p.m.	Shousetown.....
1 30p.m.	8 00p.m.	Pittsburgh.....
		6 20p.m. 11 35a.m.
		4 13p.m. 8 00a.m.
		3 08p.m. 7 09a.m.
		12 50p.m. 5 15a.m.
		10 35a.m. 1 25a.m.
		8 26a.m. 11 25p.m.
		7 45a.m. 10 45p.m.

W. C. Quincy, General Manager.
A. D. Smith, General Pass. Agent.

PENNSYLVANIA RAILROAD—P. & E. DIVISION.

On and after Nov. 15, '86, trains will leave Emporium as follows:
 For Harrisburg, Baltimore, Washington and the South, Philadelphia, New York and the East, 8:25 a. m., and 9:05 p. m. on week days. Pullman sleeping car on the 9:05 p. m. from Emporium to Philadelphia and from Williamsport to Washington.
 For Erie and intermediate stations, 10:35 a. m. week days.
 For Kane and intermediate stations, 10:35 a. m. and 6:30 p. m. on week days.
J. R. WOOD, Gen'l Pass. Agent.
CHAS. E. PUGH, General Manager.

DUNKIRK, ALLEGHENY VALLEY & PITTSBURGH R.R.

JUNE 20, 1886.

Going North.	Express. No. 2.	Mail. No. 4.	Sunday. No. 6.
Titusville, leave.....	7 35a.m.	3 20p.m.	7 35a.m.
Grand Valley.....	8 03a.m.	3 48p.m.	8 01a.m.
Irvinton.....	8 45a.m.	4 36p.m.	8 44a.m.
Warren.....	8 58a.m.	4 53p.m.	8 56a.m.
Junction.....	9 55a.m.	5 45p.m.	9 48a.m.
Lily Dale.....	10 50a.m.	6 36p.m.	10 37a.m.
Dunkirk, arrive.....	11 25a.m.	7 10p.m.	11 12a.m.
Going South.	Mail. No. 1.	Express. No. 3.	Sunday. No. 5.
Dunkirk, leave.....	9 25a.m.	4 00p.m.	2 40p.m.
Lily Dale.....	10 03a.m.	4 38p.m.	3 14p.m.
Junction.....	11 02a.m.	5 45p.m.	4 08p.m.
Warren.....	11 55a.m.	6 44p.m.	5 06p.m.
Irvinton.....	12 10a.m.	7 00p.m.	5 22p.m.
Grand Valley.....	12 58p.m.	7 49p.m.	6 12p.m.
Titusville Ar.....	1 20p.m.	8 15p.m.	6 40p.m.

Baltimore & Ohio Railroad Time Table.

Depot corner Grant and Water streets, Dec. 13, 1885. Trains will arrive and depart on Eastern Standard time.
 For Washington, D. C., and Baltimore, 8:35 a. m., limited, with Parlor car, and 9:20 p. m. daily.
 Uniontown, 6:20 a. m., 1:10 and 4:00 p. m.
 West Newton, 5:15 and 7:30 p. m.
 McKeesport, 7:20, 10:15 a. m., 12:05, 3:20, 4:30, 5:50, 6:40, 9:50 and 11:45 p. m.
 From Washington and Baltimore, 7:00 a. m. and 7:35 p. m., daily.
 Uniontown, 10:00 a. m., 2:30 and 5:45 p. m.
 From West Newton, 8:30 a. m. and 11:00 p. m. McKeesport, 6:50, 7:25, 8:00, 9:00, 11:35 a. m., 1:10, 5:00, 6:20 and 8:00 p. m. Sunday trains leave 8:35 a. m., 1:00, 7:30, 9:20, 9:50 and 11:45 p. m. Arrive 7:00, 9:00, 10:20 a. m., 7:35, 7:20 and 11:00 p. m.
WHEELING AND COLUMBUS DIVISION.
 For Wheeling, 6:50 and 8:40 a. m., 3:30 and 8:00 p. m.
 Columbus, Cincinnati, 6:50 a. m. and 8:00 p. m. Chicago express 3:30 p. m. Washington accommodation, 5:30 p. m. Sleeping car for Columbus and Cincinnati.
 From Wheeling, Columbus, Cincinnati and Chicago, 8:20 and 11:15 a. m., 4:45 and 9:40 p. m. Washington acc., 8:10 a. m.
C. K. LORD, General Passenger Agent.
B. DUNHAM, General Manager.
E. D. SMITH, Division Passenger Agent.

SHENANGO & ALLEGHENY R. R.

TAKES EFFECT MONDAY, OCT. 11, 1886.
 Trains are run by Standard Central Time (90th Meridian.)

NORTHWARD.			STATIONS.	SOUTHWARD.		
6	4	2		1	3	5
P. M.	P. M.	A. M.		A. M.	A. M.	P. M.
8 05	2 25	10 40	Ar.....Greenville.....Dp	6 07	11 10	3 20
7 55	2 15	10 30	.....Shenango.....	6 17	11 20	3 35
7 41	1 59	10 17	.....Kremis.....	6 29	11 31	3 44
7 31	1 47	10 08	.....Fredonia.....	6 37	11 40	3 52
7 24	1 40	10 02	.....Coolspring.....	6 42	11 45	3 56
7 23	1 38	10 01	.....Kerby Siding.....	6 43	11 46	3 57
7 12	1 26	9 50	.....Mercer.....	6 57	11 58	4 08
7 02	1 15	9 40	.....Pardee.....	7 07	12 08	4 17
6 57	1 07	9 36	.....Filer.....	7 11	12 12	4 22
6 49	1 00	9 29	.....Grove City.....	7 19	12 22	4 28
6 46	12 55	9 26	.....Reed.....	7 20	12 24	4 30
6 35	12 40	9 16	.....Harrisville.....	7 33	12 40	4 41
6 30	12 34	9 12	.....Wick.....	7 37	12 45	4 45
6 25	12 29	9 07	.....Branchton.....	7 42	12 50	4 50
6 22	12 25	9 05	.....Coaltown Junction.....	7 44	12 52	4 52
6 19	12 22	9 03	.....Keisters.....	7 47	12 55	4 55
6 11	12 14	8 56	.....Hallston.....	7 56	1 03	5 02
6 02	12 04	8 46	.....Euclid.....	8 07	1 13	5 11
5 53	11 54	8 37	.....Jamisonville.....	8 17	1 22	5 19
5 45	11 45	8 30	.....Oneida.....	8 30	1 31	5 25
5 35	11 35	8 20	.....P. & W. Junction.....	8 40	1 42	5 35
5 25	11 30	8 15	Dp.....Butler.....Ar	8 43	1 45	5 37
3 30	9 20	6 00	Pittsburgh & Western R. R.			
			.....Allegheny.....	10 30	3 58	7 35
P. M.	A. M.	A. M.		A. M.	P. M.	P. M.

HILLIARD BRANCH.

10	12	STATIONS.	9	11
A. M.	A. M.		A. M.	P. M.
12 00	7 30	Ar.....Branchton.....Dp	9 10	6 30
11 50	7 20	.....Bovard.....	9 20	6 35
11 30	6 56	.....Annandale.....	9 40	7 00
11 20	6 48	.....Roy.....	9 50	7 10
11 00	6 40	Dp.....Hilliard.....Ar	10 00	7 20
A. M.	A. M.		A. M.	P. M.

 Trains 4 and 5 run daily with through coach service between Allegheny, Chautauqua Lake and Jamestown, N. Y. All other trains daily except Sunday.
I. D. STINSON, G. P. A., Greenville, Pa.
J. T. BLAIR, Gen. Man., Greenville, Pa.

THE PETROLEUM AGE.

VOL. VI.

BRADFORD, PA., MARCH, 1887.

No. 2.

THE STRUCTURE OF THE TRENTON LIMESTONE IN NORTHWESTERN OHIO.

BY PROFESSOR EDWARD ORTON, STATE GEOLOGIST OF OHIO.

NEXT to the discovery of petroleum, no fact in its history has occasioned so much surprise both to the geologist and the driller, as the finding of vast accumulations of oil and high pressure gas in the Trenton limestone of Northwestern Ohio and of adjacent parts of Indiana. It is the unexpected which has happened here. The Trenton limestone is one of the most widespread strata in the eastern part of North America. It extends from Quebec to the Rocky Mountains, and from the Arctic Circle almost to the Gulf of Mexico. It crops out in ten thousand places. It melts into soils; it is quarried for building stone; it is burned for lime; it is broken into road metal, and in Northern Illinois it carries the lead ore that has long been worked there. Like all the other limestones of our geological scale, it is everywhere bituminous to a small and sometimes to a considerable extent. But no surmise or suspicion has been expressed so far as is known that it would ever become a prominent factor in the petroleum production of North America. Of all geologists who have discussed the subject, Dr. T. Sterry Hunt appears to the best advantage, in view of the recent discoveries. He was the first to teach that limestone oil is produced and stored in the limestones themselves. In making his theory universal, however, and in rejecting shales as a separate and distinct source of gas and oil, he made a mistake of the same kind that those geologists did who denied the possibility of all accumulations of oil and gas to limestone strata.

The Trenton limestone has an excellent and impervious roof in Northern Ohio. It is covered by a bed of dark or black, close grained shale, 300 feet in thickness, which is known as the Utica shale.

Above this there is found 400 to 800 feet of greenish blue or sometimes dark blue calcareous shale, with many limestone bands or "shells" included in it. This division is known in geology as the Hudson river series. Above it still another shale deposit is found, viz: the Medina shale. This stratum becomes a sandstone at the eastward and is of great economic value there. There are often thin sandstone beds found in this series in Ohio. These three shales taken together in Ohio where explored by the drill range from 625 to 1200 feet in thickness. They thin rapidly to the westward, becoming of lightest volume on the Indiana line.

Above the shales come the four principal limestones of upper Silurian and Devonian age of the Ohio scale, viz: the Clinton, Niagara, Lower and Upper Helderberg limestones. Where the entire series is found it ranges from 650 to 1100 feet in thickness. It has the greatest thickness in the extreme northwestern corner of the

State, in the same district in which the underlying shales are thinnest. This entire limestone series passes with the driller as "Niagara limestone."

The Trenton limestone is productive of oil and gas only in the uppermost fifty feet of the formation. There are one or two apparent exceptions to this rule, but in ninety-nine cases out of a hundred, the facts are found to conform to it. The Trenton limestone is incorporated with the Black river and the Chazy limestones which underlie it, and the whole series has a thickness of 500 or 600 feet in Western Ohio. Underneath the Chazy a sandstone formation is found which is presumably the Saint Peter's sandstone. It is the source in large part of what is called the Blue Lick water of the deep wells of the southwestern corner of Ohio. The productive portion of the Trenton is in composition a magnesian limestone of good degree of purity. Its porosity depends in no respect on its composition, but altogether on its crystalline character. Where coarsely crystalline it has the greatest capacity for oil and gas. In the largest gas wells in particular the limestone appears to have the most open structure.

For every productive oil rock the following conditions must obviously be met, viz: (1.) There must be a source of oil. (2.) There must be a reservoir for accumulation. (3.) There must be an impervious roof to prevent the escape of oil or gas. The Trenton limestone meets the first of these conditions universally. It is everywhere petroliferous. It doubtless held originally as much oil in one part as in another. In the second place, it is found highly crystalline and therefore porous enough to serve to some extent as a reservoir in a great majority of instances. The "sand" is good, as the driller expresses it, though the rock may be dry. In the third place the roof is never found wanting. The shale cover always does it work thoroughly and well. If these three conditions are met on a large scale, why is not the Trenton a productive oil rock on an equally large scale? Its proved area in Western Ohio exceeds 20,000 square miles, but its productive portions so far make at most but a few hundred square miles.

One factor must be added as necessary to oil and gas accumulation. The productive portion of the rock, and especially of the gas rock, must hold a certain relation in elevation to other parts of the same stratum in surrounding territory. Oil may be found in a terrace, gas must be found in an arch or dome. The larger terraces and arches will be the seat of the chief accumulation, but minor folds will also have their effect, no matter at what depth they are found.

The accompanying section from Bryan to Bucyrus, through Findlay, accurately represents the situation of the Trenton limestone so far as depth below the sea is concerned at the points which are specially named. There may be great irregularity in the intervals between the stations which subsequent drilling will bring to light, but in the drawings it is presumed that the oil

beds are regularly inclined. The well records at the several stations are given here within condensed form:

	Bryan	Defiance	Leipsic	Findlay	Carey	Bucyrus
Thickness of drift	154	18	78	8	2	30
Thickness of Ohio shale	15	60	none	none	none	130
Thickness of upper limestone	1015	960	600	237	257	815
Thickness of lower shales	665	612	778	847	1067	1170
Depth Trenton was struck	1991	1650	1456	1092	1326	2147
Depth of well	2023		1470	1171	1345	2264
Depth of Trenton below tide	1240	975	700	314	513	1235
Depth which well was cased	1300	1065	684	260	270	976

From these facts it is seen that the Trenton limestone on the line here followed rises from 1240 feet below tide at Bryan, to 314 feet at Findlay, and then descends quite slowly and apparently regularly to Bucyrus, where it has almost exactly the same depth below tide that it had at the point of beginning, viz: 1235 feet. In other words, the Trenton limestone constitutes a low arch, the summit of which is at Findlay.

The abrupt westward descent of the Trenton will not fail to be noted. The Findlay break, as this monoclinical fold may well be designated, is the most important structural feature in the new gas field of Northern Ohio. It is only at or near the summit of the break, and in the high lying regions of the Trenton that are adjacent to and dependent upon it that dry gas has been so far found. All the gas wells of Ohio taken together that draw their supplies from the Trenton limestone where it lies more than 400 feet below tide, and there are a score or more of them, will not probably aggregate 500,000 cubic feet per day; while single wells on and near the break reach a daily production of fifteen million feet. No oil wells are remunerative in Northwestern Ohio to-day which reach the Trenton at a depth of more than 500 feet below sea level. The depth at which the Trenton is found below tide for the three largest gas wells wells of the field is as follows, the wells being named in the order of their production:

Van Buren well, Trenton limestone.....330 feet below tide
Karg well, Trenton limestone.....317 feet below tide
Simons well, Trenton limestone.....301 feet below tide

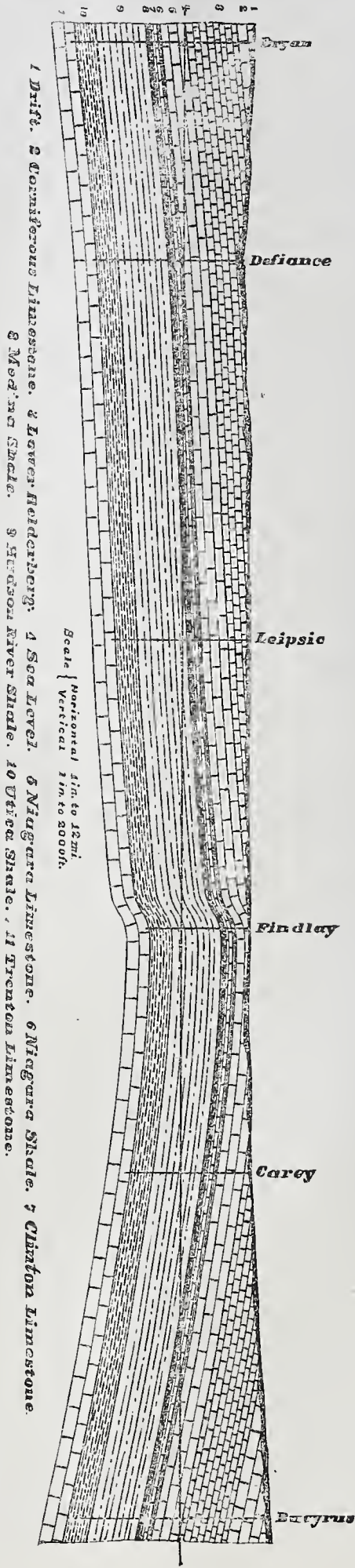
Any minor flexures in the Trenton limestone, as already observed, will secure a measure of accumulation the measure depending on the area from which gas or oil can be drained. The highest lying areas of the Trenton appear to be traps to which gas and oil ascend, and from which they cannot escape. The obvious reason why the largest accumulations of gas occur above the 400 foot level, and of oil in the Findlay field above the 500 foot level, is that the largest territory is tributary to the areas that have respectively these elevations.

One of the best examples of the efficiency of these local flexures or arches, is found in the experience of Fremont. Of nine deep wells drilled here none of them found the Trenton limestone at less than 700 feet below tide, but the tenth well, located at a central point in the town, and with deep wells arranged in a circle around it, reached the lower limestone at a less elevation than the others by fifty feet. This arch or dome gave to the last well a great advantage over all that had preceded it; in fact it yielded much more gas than all the rest combined.

The Bryan well, lately brought in, indicates with but little doubt one of these local flexures, but its importance remains to be determined. The flow of the well on Friday, February 18th, the second day after gas and oil were struck, was estimated at fifty to sixty barrels per day; on Saturday, the 19th, it was estimated at twenty-five to thirty barrels, and on Monday, the 21st, at ten

barrels. The volume of gas is considerable, reaching several hundred thousand feet per day. If maintained it will be forthwith utilized by the town, but it will still be a question whether it can be economically sought under the geological conditions that prevail here, if the

SECTION FROM BRYAN TO BUCYRUS ON A LINE BEARING SOUTH 60° EAST.



volume of the well is limited to the figures named above.

In the new gas production nothing is more significant than the experience of the Bloomdale gas field. At North Baltimore, in well No. 1, the Trenton limestone was found 451 feet below tide, and the well produced oil. In the well known as the Peters gas well, a half mile to the eastward, the Trenton limestone was 380 feet below tide. It produced dry gas. At Bairdstown, three miles further east, the limestone was 310 feet below tide. At the Simons well, two miles to the northward, it was 301 feet below. At Bloomdale, three miles to the eastward still, it was 310 feet below, and at the Water Tank wells, it had fallen to the level at which we began, viz: 380 feet below tide. A low arch is thus seen to occupy the field, the summit of which is at the Simons well, which has by far the largest production of the series, and the two flanks of the arch are found respectively at North Baltimore and the Water Tank wells, where the limestone lies 380 feet below tide.

In view of the facts above given, and a great number of similar ones, it can be affirmed in positive terms that oil and gas production in Northern Ohio are mainly dependent on the structure of the underlying Trenton limestone, that is, upon the dip and the arrangement of the stratum with reference to the surrounding territory, rather than upon any differences in the original amount of oil deposited in it.

Of the wells drilled along the line of the section, the records are about as follows: At Bucyrus neither oil nor gas was found. At Carey the search is practically a failure. The five wells that have been drilled there do not in the aggregate produce more than 50,000 cubic feet per day. At Findlay, where the Trenton limestone lies 200 feet higher than at any other point along the line, the result is known and read of all men.

Leipsic struck a little oil and more salt water. Defiance has a like record, and the facts as to Bryan have been already stated so far as they have yet come to hand.

OIL REGION CHRONOLOGY.

FOR FEBRUARY, 1887.

February 1.—AGE oil report shows 159 wells completed in January, of which 37 are dry; new production, 3707 barrels; new rigs, 78; old rigs, 124; wells drilling, 196; total field operations, 398; decrease from December, 48. Lima reports 35 wells completed in January, making the total number of wells drilled to date 370; producing wells, 269; production claimed, 7537 barrels. Market opened at 69½c, advanced to 69¾c, sold down to 67½c, reacted to 68¾c and closed at 68½c bid. Washington—Davis, No. 7, making 46 barrels an hour. Field production 7400 barrels. McKeown's, Martin, No. 3, made 375 and Munce, No. 11, 390 barrels last twenty-four hours. Phillips, No. 3, Heid farm, Reibold, reported flowing at 1500 barrel rate. National Pipe Line from Grand Valley field to Titusville begins pumping oil. Premium on Clarendon oil raised to 15 cents a barrel.

February 2.—Market opened at 67½c, weakened to 67¼c, reacted to 67¾c, broke to 66¾c, advanced to 68¼c and closed at 67½c bid. Washington—McKeown, No. 11, through sand and making 395 barrels a day; Martin, No. 3, top of "fifty-foot" and made 365 barrels last twenty-four hours; Davis, No. 7, 50 barrels an hour; Gordon, No. 6, begins spraying oil. Reibold—Phillips, No. 3, made 1000 barrels first twenty-two hours, and at 4 p. m. was making 52 barrels an hour. Bradford base

ball club admitted to the State Association of Base Ball Clubs.

February 3.—Market opened at 67¼c, advanced to 67½c, declined to 66¾c, rallied to 67¾c and closed at 67¼c bid. Washington—Butler well, Watson lot, McGahey pool, starts off at 10 barrels an hour from bottom of "fifty-foot," but falls off rapidly; Davis, No. 7; 42 barrels an hour; McKeown, No. 3, Martin, 375 barrels last twenty-four hours; Gordon, No. 6, starts at 16 barrels an hour. Reibold—Phillips, No. 3, Heid farm, increased to 60 barrels an hour; No. 4, tilling up with oil.

February 4.—Market opened at 67½c, dropped to 67c, firmed up to 67¾c, broke and closed at 66½c. Washington—Butler well, Watson lot, down to 3 barrels an hour; Gordon, No. 6, made 152 barrels first twelve hours. Reibold—Phillips, No. 3, Heid farm, doing 45 barrels an hour; No. 4, starts at 50 barrels an hour. John Borland, a milkman, killed at Reno by a train on the B., N. Y. & P. R. R.

February 5.—Market opened weak at 66½c, broke to 65¾c, rallied to 65½c, declined to 63¾c, advanced to 64¾c, then to 65c, but afterwards sagged off to 62½c, firmed up to 63¾c and closed at 63½c. Washington—Butler & Co.'s well shot yesterday with twenty quarts and making 195 barrels a day; Gordon, No. 6, increased to 20 barrels an hour. Production of field 7786 barrels from 138 wells. Reibold—Phillips, No. 3, Heid, 30, and No. 4, 38 barrels an hour. J. C. Davis shot and killed at St. Petersburg by Daniel L. King; cause, jealousy.

February 6.—Sunday. Dr. George O. Moody, of Titusville, falls dead in his house from heart disease.

February 7.—Market opened at 63½c, advanced to 64c, broke to 62½c, rallied to 63¾c and closed at 63½c bid. Reibold—Phillips, No. 3, Heid, is down to 12, and No. 4, 30 barrels an hour; agitation is only of momentary benefit. Fire at Titusville; a double dwelling house destroyed. Billingsley pipe line bill sent back to the Judiciary Committee for reconsideration. High water at Bradford.

February 8.—Market opened at 63¼c, advanced to 63¾c, and broke to 61c. It rallied to 62c and 62¾c and closed at 61¾c bid. Washington—Gordon, No. 6, increased from 12 to 22 barrels per hour, and gauged 520 barrels last twenty-four hours; McGahey, No. 7, fifteen feet in sand with no oil. Reibold—Phillips, No. 3, Heid, shot and doing 50 barrels an hour; No. 4, 42 barrels an hour. Small fire at Timmon's refinery, North Clarendon. Curious explosion of natural gas damages steamer John P. Thome, and seriously burns the captain and engineer. Gas escaped from line across Allegheny at Pittsburgh.

February 9.—Market opened at 62c, firmed up to 62¼c, receded to 62c, then advanced to 63¾c and closed at 63½c bid. Washington—Gordon, No. 6, drops off to 175 barrels past twenty-four hours; Manifold, No. 3, through sand and dry. Reibold—Phillips, No. 3, Heid, made 240, and No. 4, 785 barrels last twenty-four hours. Union Oil Company's well, on Pinkerton farm, Mount Nebo, down and dry. Oil strike reported at Francesville, Pulaski county, Indiana. Oil City Exchange sends a committee to Harrisburg to urge passage of Billingsley bill. Bill passed giving McKean county an additional law judge.

February 10.—Market opened at 64c, advanced to 64¾c, sold down to 63c, reacted to 64c and closed at 63¾c bid. Washington—Central, No. 3, Martin, 40 feet in sand with the hole full of oil; Wright, No. 4, starts at 20 barrels an hour. Reibold—Leidecker, Heid, No. 4, begins flowing by heads. Ten cars of refined oil ditched

and burned on the B., N. Y. & P. R. R., near Corry; loss, \$65,000. R. W. Criswell banqueted at Oil City upon the occasion of his return to the editorial management of the *Derrick*. Vliet, Nutt & Co., oil refiners of Cleveland, bring suit against the L. S. & M. S. R. R. for \$32,000 damages, on account of freight discrimination. High winds demolish numerous derricks throughout the Venango and Warren fields.

February 11.—Market opened at 63 $\frac{7}{8}$ c, broke to 63 $\frac{1}{2}$ c, advanced to 64c and closed at 63 $\frac{3}{4}$ c bid. Washington—Mascot, No. 7, starts flowing; Wright, No. 4, 15 barrels an hour; Gordon, No. 6, shot yesterday, made 306 barrels in thirteen hours, ending this morning. High winds blow down rigs in the Washington field. Reibold—Leidecker's Heid, No. 4, begins flowing at 40 barrels an hour. High water about Bradford. Great mass meeting held in Bradford Oil Exchange over the Billingsley bill to regulate pipe line charges. Fire at Smethport destroys Massor's wagon shop. Pipe station at Wells-ville wrecked by a wind storm.

February 12.—Market dull and featureless; opened at 63 $\frac{5}{8}$ c, advanced to 63 $\frac{3}{4}$ c, sold off to 63 $\frac{1}{4}$ c and closed at 63 $\frac{1}{2}$ c bid. Washington production 7385 barrels from 140 wells. Four wells shot during the week. Gordon, No. 6, made 480 barrels first twenty-four hours after the shot. Davis, No. 7, largest well, gauges 1020 barrels. Mascot, No. 7, through "fifty-foot" and good for 25 barrels. Two small houses burned on Hilton street, Bradford. Senator Emery addresses a large meeting at Titusville on the Billingsley bill. High water at Oil City.

February 13.—Sunday. Reibold—Phillips, Heid, No. 5, 15 feet in the sand and flowing at a 500-barrel rate; Leidecker, Heid, No. 4, flowing 50 barrels an hour. Eddie Covell, aged 16 years, suffocated by natural gas at Smith, Bright & Co.'s well, near Kinzua Village. Samuel Newell's residence and J. Brownaware's livery, at Millerstown, destroyed by fire.

February 14.—Market opened at 63 $\frac{1}{2}$ c, the highest point of the day, sold off with few reactions to 62 $\frac{1}{2}$ c and closed at same figure. Carrying rates 45c and 50c. Washington—Gordon, No. 6, doing 300 barrels a day. Reibold—Leidecker, Heid, No. 4, through pay streak and making 85 barrels an hour; Phillips, Heid, No. 5, 60 barrels an hour. Pipe line break near Wellsville pump station and sparks from a locomotive set the oil on fire; no serious damages. Large meeting of producers, refiners and others, at Oil City, to discuss the Billingsley bill. Another committee sent to the Legislature. Buck-eye Pipe Line runs, Lima field, 7257 barrels.

February 15.—Market opened weak at 62 $\frac{1}{4}$ c, sold down with a few reactions to 60 $\frac{3}{4}$ c and closed at that figure. Election of city officers. Washington—Carson farm well, Taylorstown, strikes sand with small showing; Lee & Shank. Thome, No. 2, 25 feet in the sand with no oil; McGahey, No. 7, shot and increased to 50 barrels a day. Reibold—Phillips, No. 1, Blakeley, starts at 100 barrels an hour; Blakeley, No. 2, and Markle, No. 2, are both in the sand; Phillips, No. 5, Heid, 40 barrels an hour; Leidecker, Heid, No. 4, increased from 60 to 85 barrels an hour. Climax shops at Corry, Pa., which cost \$350,000, sold by the Sheriff for \$13,101.

February 16.—Market opened weak at 60c, with few sales at 59 $\frac{7}{8}$ c, rallied with many vibrations to 61 $\frac{3}{4}$ c and closed at 61 $\frac{1}{2}$ c. Carrying rates 50c. Washington—Carson farm well, at Taylorstown, reported through the Gordon sand without oil; Gordon, No. 6, off to 150 barrels a day. Union, Morgan, No. 7, strikes heavy gas in Manifold sand and the derrick is burned down: drillers

severely burned. Reibold—Hour gauges—Leidecker, Heid, No. 4, 55 barrels; Phillips, Blakeley, No. 1, 51; Phillips, Heid, No. 5, 28; No. 3, 7; No. 4, 7. Mosby, the ex-guerrilla, lectures at Bradford Opera House. Large oil strike reported at Bryan, Williams county, Ohio.

February 17.—Market opened at 61 $\frac{3}{4}$ c, broke to 60 $\frac{1}{2}$ c and closed at 61 $\frac{1}{8}$ c. Washington—Blaney well, Taylorstown, strikes the sand; Cundall well fills up 800 feet with oil; Carson well a failure: Lee & Shank, Thome, No. 2, starts at 25 barrels an hour. Reibold—Leidecker's Heid, No. 4, increased to 95 barrels an hour; Phillips, Blakeley, No. 2, 90 barrels, and No. 1, 50 barrels an hour; Phillips, Markle, No. 2, increased to 13, and Heid, Nos. 3 and 4, to 30 barrels an hour. Production from 27 wells 8500 barrels. Alford & Dean's nitro-glycerine factory, near Eldred, blown up; no one seriously hurt, but Eldred receives a severe shaking. Meeting of Senate with committees from the oil regions to discuss the Billingsley bill; important amendments proposed.

February 18.—Market opened at 61c, sold off to 60 $\frac{3}{4}$ c, reacted to 61 $\frac{1}{4}$ c, broke to and closed at 60 $\frac{1}{2}$ c. Carrying rates 40c and 50c. Washington—Hart Bros' well, on Blaney farm, Taylorstown, reported at 13 barrels an hour; Gordon, No. 6, increased to 300 barrels; Barre, No. 10, 11 feet in the sand with hole full of oil. Reibold—Leidecker, No. 1, Blakeley, starts at 10 barrels an hour; Phillips wells gauge per hour, Heid, No. 3, 30; No. 4, 20; No. 5, 25; Blakeley, No. 1, 50; No. 2, 50; Markle, No. 2, increased from 25 to 90 barrels an hour; Leidecker, Heid, No. 4, 70 barrels per hour.

February 19.—Market opened weak at 60 $\frac{1}{4}$ c, rallied to 60 $\frac{1}{2}$ c, sank to 60 $\frac{1}{4}$ c, advanced to 61 $\frac{7}{8}$ c and closed at 61 $\frac{1}{2}$ c bid. Washington—Field gauge, 7174 barrels from 144 wells. Blaney well through sand and made 212 barrels last twenty-four hours. Rig on Thompson farm, Hickory gas district, burned by igniting gas. Engine house of B., N. Y. & P. R. R., at Olean, with six narrow gauge engines, burned to the ground. Emery Opera House, at Titusville, destroyed by fire; loss, \$25,000. John Hartwick's residence, at Pleasantville, burned; loss, \$500.

February 20.—Sunday. Reibold—Phillips, Markle, No. 2, 65; Blakeley, No. 1, 56; Blakeley, No. 2, 48 barrels an hour; Leidecker, Heid, No. 4, 100. Production of field, 9000 barrels.

February 21.—Market opened at 61 $\frac{1}{2}$ c, advanced to 62 $\frac{7}{8}$ c and closed at 62 $\frac{3}{4}$ c bid. Carrying rates—Bradford, Oil City and Pittsburgh, 50c; New York, 25c to 45c. Washington—Central, No. 3, Martin, 50 feet in sand and flowing 10 barrels an hour; McKeown, Munce, No. 12, shot and starts up at a 600-barrel rate. Reibold—Leidecker, Heid, No. 4, 75 barrels an hour; Blakeley, No. 1, increased from 56 to 80 barrels an hour; Phillips, Heid, No. 3, 25; No. 4, 20; No. 5, 20; Markle, No. 2, 60; Blakeley, No. 1, 25; No. 2, 70 barrels an hour. Production of field 8300 barrels from 28 wells. The well at Bryan, Ohio, pronounced good for 10 barrels a day.

February 22.—Washington's Birthday. No market. Reibold—Leidecker, No. 4, Heid farm, 75 barrels an hour; No. 1, Blakeley, 90 barrels an hour; Phillips, Blakeley, No. 1, 40; No. 2, 48 barrels; Markle, No. 2, 55 barrels per hour. Blaney well, Taylorstown, gauged 172 barrels last twenty-four hours. Formal opening of the new hall of the Ivy Club, in the Ivy block, Oil City. Arguments for and against the Billingsley bill heard by the Judiciary Committee at Harrisburg.

February 23.—Market opened at 63c, weakened to 62 $\frac{3}{4}$ c, advanced steadily to 65 $\frac{3}{4}$ c and closed at 65 $\frac{1}{8}$ c bid. Reibold—Phillips' wells gauge per hour, Markle,

No. 2, 50 barrels; Blakeley, No. 1, 40; No. 2, 45; Leidecker, Heid, No. 4, 60; Blakeley, No. 1, 48 barrels. Taylorstown—Noble well strikes sand and makes a 10-barrel flow; Cundell well makes a strong flow; Blayney well 165 barrels in twenty-four hours. An oil strike reported on the McKee farm, at Oakdale, on the Pan Handle Railroad.

February 24.—Market opened at 64 $\frac{3}{4}$ c, sold off to 64 $\frac{1}{2}$ c, advanced to 65 $\frac{1}{2}$ c, and broke with few reactions to 61c, firmed up to 61 $\frac{1}{2}$ c and closed at 61 $\frac{3}{8}$ c. Washington—Noble well, at Taylorstown, made 277 barrels; Cundell well 183, and the Blayney well 160 barrels last twenty-four hours. Reibold—Leidecker, No. 1, Blakeley, 64; No. 4, Heid, 70 barrels per hour; Phillips, Markle, No. 3, starts at 25 barrels an hour; No. 2, doing 37 an hour and No. 1, 36 barrels a day. The Billingsley pipe line bill reported favorably by the Judiciary Committee.

February 25.—Market opened at 61 $\frac{5}{8}$ c, broke to 61 $\frac{3}{8}$ c, advanced to 62 $\frac{3}{4}$ c and closed at 62c bid. Carrying rates 40c to 50c. Washington—Blayney well, at Taylorstown, 140; Cundell 172, and Noble 266 barrels last twenty-four hours; Wright, No. 6, starts at 27 barrels an hour. Reibold—Phillips, No. 3, Markle, 25 feet in the sand and makes 35 barrels an hour; Phillips, Nos. 3 and 4, Heid, 15, and No. 5, 10 barrels an hour; Leidecker, No. 4, Heid, and No. 1, Blakeley, 60 barrels per hour; Phillips, No. 1, Markle, shot and starts at 18 barrels an hour.

February 26.—Market opened weak at 61 $\frac{7}{8}$ c, declined to 61 $\frac{5}{8}$ c, advanced to 62c, broke to 61 $\frac{1}{2}$ c, reacted to 62 $\frac{1}{2}$ c and closed at 61 $\frac{5}{8}$ c. Carrying rates 40c to 50c. Washington production 8148 barrels from 149 wells. Six wells torpedoed during week. Taylorstown wells gauge—McManus, 51; Blayney, 144; Noble, 266; Cundell, 172 barrels; Wright, No. 6, 15 barrels an hour. Reibold gauge 7132 barrels from 29 wells. Phillips, Blakeley, No. 1, 660; No. 2, 100; Markle, No. 1, 375; No. 2, 810; No. 3, 480; Heid, No. 3, 390; No. 4, 370; No. 5, 204; No. 6, 40; Leidecker, Heid, No. 4, 1032; Blakeley, No. 1, 960 barrels in twenty-four hours. Shannopin production 2067 barrels from 86 wells. Large meeting of producers at the Bradford Oil Exchange to hear report of the committee sent to Harrisburg in the interests of the Billingsley bill. Hennigan well, at North Baltimore, Ohio, reported to have made 1000 barrels in sixteen hours.

February 27.—Sunday.

February 28.—Market opened and closed at 61 $\frac{5}{8}$ c, fluctuating between 61 $\frac{7}{8}$ c and 61 $\frac{3}{8}$ c all the day. Carrying rates—Bradford, 45c; New York, 55c; Oil City, 45c; Pittsburgh, 35c. Lima oil marked down from 35c to 30c a barrel. Taylorstown—Blayney well made 183 barrels last thirty-six hours; Noble 204 the last twenty-four and the Candell 348 the last seventy-two hours. Reibold—Phillips wells gauge, Blakeley, No. 1, 22; No. 2, 32; Markle, No. 2, 28; No. 3, 12 barrels per hour; Leidecker, Heid, No. 4, 30; Blakeley, No. 1, 25 barrels an hour; Phillips, Heid, No. 3, 310; No. 4, 240; No. 5, 153 barrels a day. Titusville endorses the Billingsley bill; speeches by David Kirk and others. Cleveland's nitro-glycerine magazine, near Kane, explodes. No one injured.

It is estimated that 700 million of cubic feet of natural gas are consumed per day at Pittsburgh. The price paid for domestic use is about eight cents per thousand, under most contracts five cents per thousand is paid, and those who employ natural gas for manufacturing purposes pay less than three cents per thousand cubic feet.

THE BILLINGSLEY BILL.

THE POWER OF THE LEGISLATURE TO REGULATE PIPE LINE CHARGES.

A. LEO. WEIL.

IN discussing the proposed legislation, we are met on the threshold with the constitutional objections:

1st. That it impairs the obligation of contracts.

2d. That it is a regulation of commerce between the States.

Next, sundry objections are made to the amendments suggested by the Producers' Committee, both as to their phraseology and effect, and lastly it is urged that it is unwise to legislate at all on the subject. An examination of the authorities reveals the same line of objections raised in almost every case where States have attempted to regulate the business of corporations doing business within their borders. We are therefore not troubled to find precedents, but overwhelmed with the torrent of decisions on the subject.

First:—That it impairs the obligation of contracts. This objection is made by the attorneys of the National Transit Company.

The "Pennsylvania Co." was incorporated by special Act of the Legislature, approved April 7th, 1870. (P. L. 1870, page 1025.)

The "Overland Contract Co." was incorporated on the 22d day of March, 1871, by special Act, and given the same rights and franchises as those granted to the "Pennsylvania Co." (P. L. 1871, page 438.)

The name "Overland Contract Company" was changed to the "Southern Railway Security Company" by paper filed in the office of the Secretary of the Commonwealth on the 16th day of May, 1871.

The rights and franchises of the Southern Railway Security Company were sold by the Sheriff of Dauphin County, and the purchasers organized under the Act of May 25th, 1878 (P. L. 1878, page 145), under the name, "National Transit Company," with a capital stock of \$100,000 (certificate of organization recorded in the office of the Secretary of the Commonwealth in Mis. Rec., Vol. 2, page 315) and accepted Article XVI of the Constitution by paper filed April 21st, 1881. (Mis. Rec., Vol. 2, page 313.)

An election return was filed, authorizing an increase of the capital stock from \$100,000 to \$30,000,000, January 5th, 1882. (Mis. Rec. Vol. 2, page 529.)

Return of increase of the capital stock of the amount of \$29,300,000, filed March 16th, 1882. "All of which increase was paid for property at its true value." (Mis. Rec., Vol. 3, page 530.)

Return of increase of the capital stock of the amount of \$600,000, filed January 27th, 1883. "All of which increase was paid for property at its true value." (Mis. Rec. Vol. 3, page 170.)

Another election return was filed December 29th, 1882, authorizing an increase of the capital stock to a total of \$32,000,000. (Mis. Rec., Vol. 3, page 153.)

Return of increase of the capital stock of the amount of \$663,100, filed March 11th, 1884. "All of which increase was paid for property at its true value." (Mis. Rec., Vol. 3, page 506.)

Return of an increase of the capital stock of the amount of \$555,900, filed May 6th, 1884; this makes the total capital stock of the corporation \$31,819,000. "All of which increase was paid for property at its true value." (Mis. Rec., Vol. 4, page 5.)

An election return was filed January 12th, 1886, authorizing a reduction of the capital stock to the extent of twenty per cent., making the capital stock \$25,455,000. (Mis. Rec., Vol. 4, page 361.)

Return of reduction of the capital stock from \$31,819,000 to \$25,455,000, filed February 2d, 1886. (Mis. Rec., Vol. 4, page 381.)

The Pennsylvania Company, by its charter, was granted the right *inter alia*, "to fix and regulate the tolls and charges to be charged or demanded for any freight, property or passengers traveling or passing over any improvement erected, managed or owned by the said company, or any merchandise or property transported over any road whatever by the said company, etc." The National Transit has the same power.

The fourth amendment of 1857, Article 1, Section 26, to the Constitution of Pennsylvania, provides: "The Legislature shall have the power to alter, revoke or amend any charter of incorporation hereafter conferred by or under any special or general law, whenever in their opinion it may be injurious to the citizens of the Commonwealth, in such manner, however, that no injustice shall be done to the incorporators."

The Constitution of 1874, whose provisions the National Transit Company accepted, contains a similar provision.

Mr. Justice Field, of the Supreme Court of the United States, in the case of the County of San Mateo vs. The Southern Pacific Railroad Company, in the United States Circuit Court at San Francisco, in 1882, remarks upon the Legislative power of repealing and amending charters, where such power has been reserved by a State in its Constitution, as follows:

"The reservation of power over the franchise, that is, over that which is granted, makes the grant a conditional or revocable contract, whose obligation is not impaired by its revocation or changes. The Supreme Court established in Dartmouth College case that the charter of a private corporation is a contract between the corporators and the State, and that it was, therefore, within the prohibition of the Federal Constitution against impairment of contracts. To avoid this result, the States have generally inserted clauses in their Constitutions reserving the right to repeal, alter or amend the general laws under which corporations are allowed to be formed. The reservation relates only to the contract of incorporation, which, without such reservation would be irrevocable. It removes the impediment to legislation touching the contract. It places the corporation in the same position it would have occupied had the Supreme Court held that charters and not contracts, and that laws repealing or altering them, did not impair the obligation of contracts."

In *Detroit vs. Detroit and Howell Plank Road Company*, 43 Mich., 140, the following views are expressed: "But for the provision of the Constitution of the United States, which forbids the impairing of contracts, the power to repeal and amend corporate charters would be ample, without being expressly reserved. The reservation of the right leaves the State where any sovereignty would be, if unrestrained by express constitutional limitations, and with the powers it would then possess."

Whenever the power to repeal, alter or amend a charter is reserved in it, its exercise does not impair the obligation of the contract. *Commonwealth vs. Fayette County Railroad Company*, 5 Smith, 45.

To the same effect are numerous authorities in Pennsylvania referred to by Mr. Buckalew in his work on the

Constitution in note to Section 10, Article 16. See also *Greenwood vs. Freight Company*, 105 United States, 13, for history and effect of such reservations. An unbroken line of decisions by the Supreme Court of the United States, and of the several States, sustain the doctrine above stated. It will be observed that by the reservations contained in the Constitutional Amendment of 1857 and the Constitution of 1874, the State has ample power in the premises.

"The obligation of a contract consists in its binding force on the party who makes it. This depends on the laws in existence when it is made; these are necessarily referred to in all contracts and forming a part of them as the measure of the obligation to perform them by the one party and the right acquired by the other." *McCracken vs. Hayward*, 2 Howard, 608.

And, again, Mr. Justice Washington, in *Ogden vs. Saunders*, 12 Wheat, 213: "The obligation of a contract is the law which binds the parties to perform their agreement. The law, then, which has this binding obligation, must govern and control the contract in every shape in which it is intended to bear upon it, whether it affects its validity, construction or discharge." After discussing which law the above refers to, he continues: "It is then, the municipal law of the State, whether that be written or unwritten, which is emphatically the law of the contract, made within the State, and must govern it throughout whenever its performance is sought to be enforced, it forms in my humble opinion, a part of the contract," etc. But it is unnecessary to cumulate authorities.

Mr. Dodd, in his argument before the committee, conceded that you could "take away" their charter; could "alter it as you see fit."

I have devoted this much space to the question, because other counsel representing the National Transit Company gave it considerable prominence.

Of a provision almost identical with that contained in the National Transit charter, in a recent case decided January 4, 1886, Chief Justice Waite says:

"The case turns consequently on Section 12, which is, 'that it shall be lawful for the company * * * from time to time to fix, regulate and receive the toll and charges by them to be received for transportation,' etc., this would have been implied from the rest of the charter if there had been no such provision, and it is argued that, unless it had been intended to surrender the power of control over fares and freights, this section would not have been inserted. The argument concedes that the power of the company under this section is limited by the rule of the common law which requires all charges to be reasonable. In *Munn vs. Illinois*, 94 United States, 113, and *Chicago, Burlington & Quincy R. R. Co. vs. Iowa*, 94 United States, 155, this court decided that as to natural persons and corporations subject to legislative control, the State could, in cases like this, fix a maximum beyond which any charge would be unreasonable, and that such maximum when fixed would be binding on the courts in their adjudication, as well as on the parties in their dealings. The claim now is that by Section 12 the State has surrendered the power to fix a maximum for this company, and has declared that the courts shall be left to determine what is reasonable, free of all legislative control. We see no evidence of any such intention. Power is granted to fix reasonable charges, but what shall be deemed reasonable in law is nowhere indicated. There is no rate specified, nor any limit set. Nothing whatever is said of the way in which the question of reasonableness is to be settled

All that is left as it was. Consequently, all the power which the State had in the matter before the charter it retained afterwards. The power to charge being coupled with the condition on the subject of reasonableness within the limits of its general authority as circumstances may require. The right to fix reasonable charges has been granted, but the power of declaring what shall be deemed reasonable has not been surrendered. If there had been an intention of surrendering this power, it would have been easy to say so. Not having said so, the conclusive presumption is there was no such intention." And again: "We return to the special provisions of the charter on which this case depends, and find, first, the authority given the corporation to carry persons and property. This of itself implies authority to charge a reasonable sum for the carriage. In this way the corporation was put in the same position a natural person would occupy if engaged in the same or like business. Its rights and its privileges in its business of transportation are just what those of a natural person would be under like circumstances: no more, no less. The natural person would be subject to legislative control as to the amount of his charges. So must the corporation be. That was decided in *Railroad Company vs. Maryland*, 21 Wall, 456; *Chicago, Burlington & Quincy Railroad Company vs. Iowa*, 94 United States, 155; *Peik vs. Chicago & Northwestern Railway Company*, 94 United States, 164; *Winona & St. Peter Railroad Company vs. Blake*, 94 United States, 180, and *Ruggles vs. Illinois*, 108 United States, 526, 531." I take it that further comment is unnecessary.

Second—Does the proposed law regulate commerce between the States in the sense prohibited by the Federal Constitution. It will not serve any useful purpose to follow the course of judicial interpretation upon this subject since very recent cases have reviewed the law.

It was thought by the profession as is disclosed by the decisions of the courts of last resort in many States (notably Illinois) that the granger cases decided what Mr. Justice Bradley states, in his dissenting opinion in *Wabash & C. R. R. Co. vs. Illinois*, 118 U. S., 577, namely: that "in the absence of Congressional Legislation, a State Legislature has the power to regulate the charges made by the railroads of the State for transporting goods and passengers to and from places within the State, when such goods or passengers are brought from, or carried to, points without the State, and are, therefore, in the course of transportation from another State or to another State."

He cites in confirmation of his opinion: *Wilson vs. The Blackbird Creek Co.*, 2 Pet., 245; *Gilman vs. Philadelphia*, 3 Wall, 713; *Escanaba Co. vs. Chicago*, 107 U. S., 678; *Transportation Co. vs. Parkersburg*, 107 U. S., 691; *Cooley vs. The Port Wardens of Philadelphia*, 12 How., 299; *Gloucester Ferry Co. vs. Pennsylvania*, 114 U. S., 196; *R. R. Co. vs. Maryland*, 21 Wall., 456; *Peik vs. Chicago & Northwestern R. R.*, 94 U. S., 164; *State Tax on Railway gross receipts*, 15 Wall., 284; *Osborne vs. Mobile*, 16 Wall., 479; *R. R. Co. vs. Fuller*, 17 Wall, 560; *R. R. Commission Cases*, 116 U. S., 307. Chief Justice Waite and Mr. Justice Gray concurred in this opinion.

But, however, that may be, the majority of the court in this case while not going quite so far, have established beyond question, that the State has power by legislation to regulate charges of transportation of passengers and goods when such transportation begins and ends within the limits of the State, and that laws passed for this

purpose are not regulations of foreign or inter-State commerce prohibited by the Federal Constitution.

The general power of the Legislature to regulate charges for transportation and storage is sustained in all the decisions. Mr. Justice Miller in delivering the opinion of the court in the *Wabash* case, says of the *Granger* cases: "The great question to be decided and which was decided and which was argued in all those cases, was the right of the State within which a railroad company did business to regulate or limit the amount of any of these traffic charges. * * * * *

And in that case (*Munn vs. Illinois*) the court was presented with the question which it decided, whether any one engaged in a public business, in which all the public had a right to require his service, could be regulated by Acts of the Legislature in the exercise of this public function and public duty, so far as to limit the amount of charges that should be made for such services."

Wabash & C. R. R. Co. vs. Illinois, 118 U. S., 558-569.

The case of *Munn vs. Illinois* involved the right of the Legislature to pass an Act regulating public warehouses and fixing a maximum charge for storing and handling grain. *Munn* had a grain elevator. The court decided *inter alia*.

Under the powers inherent in every sovereignty, a government may regulate the conduct of its citizens toward each other, and, when necessary for the public good, the manner in which each shall use his own property.

It has, in the exercise of these powers, been customary in England from time immemorial, and in this country since its first colonization, to regulate ferries, common carriers, hackmen, bakers, millers, wharfingers, innkeepers, etc., and in so doing, to fix a maximum of charge to be made for services rendered, accommodations furnished, and articles sold.

When an owner of property devotes it to a use in which the public has an interest, he in effect grants to the public an interest in such use, and must to the extent of that interest submit to be controlled by the public for the common good, as long as he maintains the use. He may withdraw his grant by discontinuing the use.

The limitation by legislative enactment of the rate of charges for services rendered in a public employment, or for the use of property in which the public has an interest, establishes no new principle in the law, but only gives a new effect to an old one.

Munn vs. Illinois, 94 U. S., 113.

It is said by C. J. Waite in *R. R. Commission cases*, 116 U. S., 307, decided January 4, 1886: "It is now settled in this court that a State has power to limit the amount of charges by railroad companies for the transportation of persons and property within its own jurisdiction unless restrained by some contract in the charter, or unless what is done amounts to a regulation of foreign or inter-State commerce," citing *R. R. Co. vs. Maryland*, 21 Wall., 456; *C. & B. & Q. R. R. Co. vs. Iowa*, 94 U. S., 155; *Peik vs. C. & N. R. R. Co.*, 94 U. S., 164; *W. & St. P. R. R. Co. vs. Blake*, 94 U. S., 180; *Ruggles vs. Illinois*, 108 U. S., 526.

In the above citations of authority I have confined myself to recent cases only, and from them deduce the following conclusions:

First—The proposed legislation does not impair the obligation of the contract made by the State with the National Transit Company.

Second—The proposed bill if limited in its operation to transportation and storage of oil, which begins and

ends within the State, is not a law regulating commerce between the States within the prohibition of the Federal Constitution.

Third—The Legislature has the power to pass laws for the purposes contemplated by this bill.

We now come to the question of expediency, and permit me to remark, with reference to the multifold objections raised by those companies whose charges the bill under consideration is intended to regulate, that

"No man e'er felt the halter draw
With good opinion of the law."

The predictions dire, about the ruinous effect of the Inter-State Commerce Bill, are no comparison to the evils, woeful and many, which it is prophesied, will befall the unhappy producer if this bill becomes a law.

The National Transit Company have practically a monopoly of carrying and storing of oil.

The entire production for 1886 in the States of New York and Pennsylvania was 25,145,088 barrels, of this there was run by the National Transit and lines now owned or controlled by it 25,023,341 barrels, thus leaving only 121,747 barrels for the independent lines, or less than one-half of one per cent. The following I copy from the January number of THE PETROLEUM AGE, a journal recognized for its accuracy in statistics:

PIPE LINE RUNS, 1886.

	Barrels.
National Transit Company.....	19,613,324
Tidewater Pipe Company.....	2,328,596
Southwestern Pennsylvania.....	2,703,361
Pittsburgh Pipe.....	378,060
Octave Oil Company.....	53,001
Shaffer Run (partially).....	5,784
Excelsior Oil Company.....	77,962

The first four are owned or controlled by the National Transit Company. The Pittsburgh Pipe Line has only recently gone where the pipe lines go. It is a late acquisition by the National Transit, who needed that three hundred thousand barrels in its business, I suppose.

We may learn another lesson from the report of shipments from the region, and I am informed by those who compiled these statistics that the same are taken from the pipe line statements, published every month and sworn to, in pursuance of law.

	Barrels.
National Transit Company.....	22,418,747
Tidewater Pipe Company.....	2,447,241
Southwestern Pennsylvania.....	1,689,285
Pittsburgh Pipe Line.....	371,498
Octave Oil Company.....	36,357
Shaffer Run (partially).....	1,920
Excelsior Oil Company.....	63,465
Total.....	27,028,513
National Transit Company and lines owned or controlled by it.....	26,926,741
Independent lines.....	101,572

Has the National Transit a virtual monopoly? It permits scarcely a greasy barrel to escape.

Now, let us examine the question of income. Mr. Scheide, in his remarks before the committee, showed them sundry items on the one side of the ledger only. True, some of them did amount to several hundred thousand dollars, and I believe one item was nearly a million and a half. He gave no figures as to receipts—his remarks were all "outgo," no "income." We are liable to err in making an approximate statement from the facilities we have, but I will endeavor to be fair, and when I get through you may credit them with two or three millions a year "to balance prejudice of book-keeper," and still I think the result startling. Pipeage on pipe line runs, 1886, by National Transit and lines controlled or owned by it, 25,024,341 barrels at 20 cents, \$5,004,668.20. Shipments from regions, 1886, by National Transit and lines controlled or owned by it, taking the transportation at 40 cents, being about the average, we have the astounding result: 26,926,741 barrels at 40 cents=\$10,770,696.40. (The schedule of rates for lower

country crude to New York is 55 cents; to Philadelphia and Baltimore, 50 cents; for Bradford and Clarendon crude to New York, 45 cents; to Philadelphia and Baltimore, 40 cents. The rate to Cleveland I was unable to ascertain, but report puts it at from 30 cents to 35 cents. New York is the largest and Cleveland the next in importance of the refining centres.)

Gross stocks held by the various pipe line companies at the end of each month for the year 1886, at a uniform rate of 40 cents per day on each 1000 barrels as now charged by the National Transit Company.

January.....	33,608,364 barrels, 31 days	.....\$416,743 71
February.....	33,180,057 " 28 "	.....371,616 63
March.....	33,053,140 " 31 "	.....416,058 93
April.....	32,946,618 " 30 "	.....395,349 41
May.....	33,059,909 " 31 "	.....409,942 87
June.....	33,305,775 " 30 "	.....399,639 30
July.....	33,492,230 " 31 "	.....415,303 65
August.....	33,853,632 " 31 "	.....419,229 03
September.....	34,081,064 " 30 "	.....408,972 76
October.....	34,031,462 " 31 "	.....421,990 12
November.....	33,733,796 " 30 "	.....404,705 55
December.....	33,367,898 " 31 "	.....413,761 93

Total storage for 1886.....\$4,894,341 89

The National Transit on this would be entitled to a credit for private storage, and for stocks held by other lines, about eight per cent., which leaves the storage for the National Transit for 1886, a little over \$4,500,000. Thus to recapitulate, the income of the National Transit and its lines for 1886, was as follows:

Pipeage from wells, 25,023,341 bbls., at 20c.....	\$ 5,004,668.20
Pipage from regions, 26,926,741 bbls., at 40c.....	10,770,696.40
Storage on stocks.....	4,500,000.00

Total income 1886.....\$20,275,364.60

As against this, charge the running expenses. Does anyone doubt they are less than \$1,275,000 per annum.

The new lines and tankage are a part of the construction account, they are counted in the plant and form a part of the capital.

The capital stock of the National Transit and Tidewater combined is about \$31,000,000. Neither company owe anything, hence this represents the entire investment. It is confidently asserted by parties once connected with the National Transit Company that it never invested more than \$50,000 in its business and that all the increase has been from the earnings of the company, for that statement I do not vouch. The astounding figures presented are too large for the mind to grasp. Let me illustrate them: The annual income as given will buy thirty-seven thousand miles of two-inch pipe, or enough to go around the world and up over it, tie a bow-knot on top, with streamers several thousand miles long.

The annual income just given would buy a six-inch line of pipe over six thousand miles long or enough to lay a double line to Liverpool.

The annual income just given would buy three thousand miles of six-inch pipe, enough to lay lines from the oil country to New York, Philadelphia, Cleveland, Buffalo, Pittsburgh and Baltimore (and still have some left), buy two thousand miles of two-inch pipe, buy thirty-three million barrels of tankage, (enough to carry all the stocks,) and have left over three millions of dollars with which to lay the pipe. In other words, the annual income will almost if not quite replace the plant.

In the discussion before the committee very little was said by the officers of the company as to the *reasonableness* of their charges. We are asked if this business is so profitable why do others not engage therein?

The momentum of capital is so great it is impossible to stop it. The Standard Oil Company owns the National Transit Company and also the refineries. I am reliably informed that the independent refineries in the United States do less than 10 per cent. of the refining,

hence practically the Standard is the only purchaser of the oil. Now then, if you start a pipe line you must also start a refinery; to prevent competition, the Standard can afford to do its pipe line business for one year for nothing, in other words, with an annual income of \$20,000,000 on a \$31,000,000 capital, it can better afford to lose one year's income than to share the profits in years to come.

Can any party contemplating engaging in the business undertake such a contract? If you engage in the refining business alone, the enormous earnings of the pipe lines permit them to refine at a loss; if you go into the pipe line business, the earnings of the refineries enable them to pipe oil at a loss; if you engage in both refining and pipe line business, for each of which you must be qualified by education and experience, their enormous accumulation of profits, their intrenched position, their ability to control the railroads and some times Legislatures, in other words, their immense momentum of capital and business, will bear down and crush all opposition. History has disclosed that their methods have not always been in consonance with strict commercial honesty. But assume, if your imagination is capable of such a feat, that they have gained their present vantage ground honestly, by business foresight, prodence and sagacity, yet having now attained such vast, such dangerous, such overwhelming power, is it not wise for the Legislature to place upon them a restraining hand?

What is done with the refineries they crush? Do they run them? Their empty stills, tumble down chimneys and battered roofs, are left to mark the buried fortunes, and too often, the ruined ambition and murdered hopes of the former owners, monuments to the folly of attempted resistance to the greatest monopoly the world ever knew.

The plea is urged that there are now about thirty million barrels of stocks, which was run into the lines under contract and stored under contract; that these contracts cannot be disturbed, ergo: you must not legislate for the future because you cannot for the past.

Even if the premises were conceded, this would be a monstrous proposition, because forsooth, a little over one year's production was subject to onerous exactions, to extortion, this Legislature must visit the sins of the Standard Oil Company against us, our children, their children's children. Because we have been so long sinned against, the Legislature must permit all future generations to be sinned against. But is the contention that the oil is stored under such contracts as cannot be disturbed, true? Why is the certificate renewed every six months? If the certificate is a contract for storage, it is for six months from its date only, and in consequence six months would regulate this whole matter. But even more, the oil is in the line for no definite period, it is subject to call. Suppose the day after the passage of this law the owner of the certificate demands his oil? that would terminate the old contract, and he could then redeliver under the new rate. Would the lines dare say to him: You must, to terminate your contract, actually take your oil out, although the next minute you can compel us to again receive it for storage? We apprehend no danger from that source. Suppose with reference to pipage the owners of certificates demand a reduction, the lines refuse, suit is instituted in a test case to compel the reduction, under the law as stated by the Supreme Court of the United States, that the charges must be reasonable, that the law of the land is part of the contract, and a showing of the facts and figures, above given, would not the courts

compel a reduction? The party would be entitled to resist the extortion until after the money was actually paid, until the contract was executed. The pipeage has not yet been paid, and is never collected until the oil is taken out of the line, this is not impairing the obligation of any contract, as I view it.

But if you pass this law and the pipe lines resist its application by vexatious litigation and unreasonable or contumacious proceedings, there rests with you a power to wipe them out of existence, and if to regulate this business, and prevent the grossest extortion, amounting almost to robbery, which has rendered possible this speedy accumulation of millions, such heroic treatment becomes necessary, then in Heaven's name let the power be exercised, but of this anon.

It is hinted that to regulate the price of storage and transportation of oil in the State of Pennsylvania (and it is conceded that you cannot do more than this, *i. e.*, regulate the charge for transportation and storage where the same begins and ends in this State,) would greatly interfere with the pipe lines' present method of doing business, perhaps it would, let us hope it would. Under their *present method* our oil is taken to New York and Cleveland, to Buffalo, Olean and Baltimore and there refined, while the refineries of the oil country, of Pittsburgh and Philadelphia are, most of them, dismantled and idle. The present bill would enable the independent refiner to get his oil delivered in Pittsburgh or in Philadelphia, by the pipe line, at a reasonable price. If you have your works in Philadelphia, the pipe lines, under their present system, can deliver the oil at Olean. You must transport the same by rail. If you are in Pittsburgh, they will deliver perhaps at Butler, perhaps elsewhere. What reason is there for this? This bill is not intended to protect *the present system*, but to protect our citizens engaged in the business. You all know the recent scandals about the railroads and the Standard Oil Company, the conspiracy which killed the independent refineries all over the State. We are asking you now to place it out of the power of the pipe lines, to repeat those dastardly deeds and destroy those brave refiners, whose only crime is aspiring to compete with the Standard Oil Company. By what right and for what reason does a pipe line company, with a station in Pittsburgh, deliver to a refiner there, oil in Bradford or Butler? Is it not an outrage? If all the oil produced in Pennsylvania, after the passage of this act, was run into the pipe lines, and no contract made, the presumption would be that it was to be stored in the State, if a certificate is issued, and a Pittsburgh or a Philadelphia refiner purchases the same and demands his oil, the Act would apply, and the storage and transportation charges would be regulated. If, however, a New York refiner buys the certificate and demands delivery there, then our Act would not apply, and the pipe lines might charge the New Yorker so much as to compel him to remove to Philadelphia to get the protection of our laws, a consummation devoutly to be wished.

But all of the threats, or rather suggestions, of the pipe lines about the injury to the producer, or refiner, or speculator, are idle, and unworthy of consideration.

The pipe lines have a business in which thousands of people are interested—the producer, the refiner, the speculator, the public generally; but it must also be borne in mind that the owners of the pipe lines are also interested. If our law is reasonable, the rates we establish will govern the lines here; and to protect their business and produce uniformity, they will in all likelihood adopt the same everywhere. They can't afford to

kill the speculator; they can better afford to grind the producer or mutilate the refiner, but the speculator is the pipe lines' friend; they can make him pay storage on stocks, can bleed him on the ups and downs of the market, can use his capital to carry thirty million barrels of stock, now on top of ground. Occasionally the speculator must disgorge—pay over all he has made—but aside from this little pleasantry, the speculator will be protected by the pipe lines at any cost ————— to somebody else.

With reference to the question of deduction for waste, shrinkage, etc.: The powers of the Legislature to regulate these deductions is denied by the learned gentlemen who represent the National Transit Company. The power to fix a maximum charge for storage, in the light of *Munn vs. Illinois*, must be conceded. Shrinkage, waste, etc., is an incident of storage and it seems to me is subject to the same rule.

These charges are necessarily approximate, the loss from these sources differing in different localities under different conditions. The pipe line officials do not pretend that the uniform charge of 3 per cent. covers the actual loss for each run of oil. The lines predicate this charge on the aggregate loss on the entire stocks, for a term of months. It is a matter peculiarly subject to imposition, because no one is in a position to ascertain the exact facts but the pipe lines; and by appliances, late improvements and devices, the amount of waste or shrinkage is being continually diminished. Those familiar with the business say tanks can be constructed so that the shrinkage and waste will vary, as between the different devices, as much as 5 per cent.

Surely, as an incident to storage, and from the very nature of the charge, and to prevent imposition on the public, this matter can, and more than all else, ought to be regulated by the Legislature.

To the uninitiated, it may seem strange that so much is said, in the discussion of the proposed legislation, about the National Transit Company, and so little about other lines, it is upon the same principle expounded by the old law commentators, *de minimis lex non curat*. The lines which are not controlled by the National Transit Company, I believe, bear the proportion of about one to two hundred. They are local and confined in their operations to small districts. As soon as they become ambitious, their doom is sealed. You have heard how the National Transit begins its operations against a young rival, just essaying its maiden step, first the price of oil in the locality is raised, *i. e.*, a premium paid, from five to twenty cents per barrel, next, pressure is brought to bear on the producer who has oil wells in other sections, and is there solely dependent on the National Transit, he is in consequence afraid to run into the independent line, if this is not sufficient, more heroic treatment is resorted to, but this, after a short time, usually enables the National Transit to absorb the plant. Suppose in a particular section, the National Transit thought it advisable to give a premium of fifty cents per barrel, they could afford to do it for months, because of the tremendous earnings all along the line, they have been known to give as much as thirty cents per barrel. Opposition now, competition in an ordinary business sense, is as much beyond the realm of possibility, as if by law they had the exclusive privilege to pipe, store and refine oil.

It will, no doubt, be asked how was this intrenched position obtained? Ah, there's the rub. Could the Legislature of past years have foreseen the logic of events could the law officers of the Commonwealth have read

in connection with certain "combines," "pools" and "arrangements" the criminal code, and not had the "strong lance of justice hurtless break," because the sins they saw, were plated with gold, we would not now be here. Referring only incidentally to the inception of the Standard Oil Company, its unholy practices, rendered possible by the then unprincipled management of the Erie Railroad, its jugglery with stocks, with cars, its deviltry with railroads and rebates, the revelations whereof, as disclosed by subsequent Legislative investigations, read like a romance, we come down to the time when what was called free pipe bills, were presented again and again to the Legislature. The Standard Oil Company by a course of espionage on every pipe line projected, by purchasing the land in its track, by conspiracies with the railroad companies, prevented any independent line from reaching the railroad. Opposition was thereby effectually paralyzed. The Legislature was urged, besought to pass a free pipe bill, but some influence greater than the public good, or the imperative need of the oil country operated upon the mind of the Legislature, and the oil man was denied. When at last, after great labor, the General Assembly was delivered of the present deformity, by some yeilded a free pipe bill, the Standard had occupied the ground, thrown up their breastworks and planted their batteries, with their large caliber Krupps, and their Mittraileuse, with their standing army under trained generals, with a commissariat practically inexhaustible, and a treasury which compared to that of Croesus, is like the nominal and actual assets of Grant & Ward, they awaited the onslaught of the handful of producers armed with blunderbusses and squirt guns. Gentlemen, do not fall into the error of your predecessors, do not delay; the time is ripe for action. Your powers are great. You can restrain this hydra headed monster which has crushed the refining industries of our State and brought poverty to the firesides of hundreds, where plenty would otherwise prevail, this demon, insatiate and unsatiable, which takes into its cavernous maw, the substance of the oil producing world, that it may vomit wealth into the lap of a few men, whose opulence, even now, is the wonder of the century. Nay, more, if the necessities are sufficiently great, and they are not far therefrom, you have the power to say to this corporation, "have done, thy dissolution approaches, to-morrow thou shalt die." You can take away from them their privileges and franchises, and say to them, they shall, for a reasonable compensation, deliver to another, such of their property as shall be necessary to fulfill the public use.

"O, 'tis excellent to have the strength of a giant" and not tyrannous to use it on a giant.

In conclusion permit me to say, I believe the beginning of the end has commenced. I believe the day not far distant, when relief will be had. The wall is covered with handwriting. The influence which causes the Czar of all the Russias to quake upon his throne, and which the iron chancellor dreads more than the menaces of France, which rules this country and makes its laws, has enlisted in our fight; the people and the press have entered the lists with us, with their assistance, sooner or later we must win. I remember reading a fairy tale of a whole city, which was in one night turned to stone, there stood the war horse, gaily caparisoned for battle, there stood the warrior, with his hand of stone on the cold mane of the petrified steed, all was still, lifeless, deathlike, silent, suddenly the trumpets blast was heard, the horse utters the war neigh, the warrior leaps upon his steed, and with lance upraised rides on to victory. I can hear the bugle call of the press, and see the majesty of the law, aroused from his statue like repose, ride forth, stalwart and vigilant, to do battle with the Standard, there can be but one issue to this conflict, no golden coat of mail will be proof against his lance of justice.

THE PETROLEUM AGE,

DEVOTED TO THE
INTERESTS OF THE PETROLEUM TRADE.

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HEYDRICK'S ARGUMENT.

THE AGE has attempted in this issue to present the producers' side of the case in the effort to reduce the cost of pipeage and storage by legislative action. Mr. Weil's argument has been presented in full. Mr. Heydrick's arrived too late to give entire, but the portion that refers to an important point that has been made by many, in regard to the effect of the Billingsly bill upon contracts now in force, or as affecting oil produced in the past and at present drawing storage, is presented below:

It is further contended that the proposed law would violate some contract or contracts in respect to the 30,000,000 barrels of oil now held in storage by the National Transit Company.

To this contention it ought to be sufficient to reply that if the National Transit Company has any valid contracts, in respect to stock oil, of the character which the Federal Constitution protects, the Federal Constitution will protect them. The bill does not propose to interfere with any such contracts. But I propose to meet the issue tendered upon this point now and here.

What are these contracts? It is said that the National Transit Company has given notice that all petroleum delivered to it will be subject to a charge of five-eighths of 1 per cent. per barrel for every fifteen days so long as the same shall remain in its custody, and that every producer who delivers oil to that company, thereby contracts to pay that rate of storage, and that there is no escape from such contract. That depends upon something more than has been stated. If a highwayman meets you upon the road and demands your money or your life, and you give him your pocketbook, he cannot afterwards claim it as an executed gift. And why not? Obviously because he had no right to make the demand. If he had met you upon equal terms and solicited alms which you were at liberty to withhold or bestow, it would have been otherwise. The warehouse man, like the common carrier, especially when he enjoys a monopoly, either legal or virtual, in his business does not meet his patrons upon equal footing, and for that reason the law does not allow him to stand upon his vantage ground and say to the public: "You must pay me so much or go your way." As we have already seen he is held to "exercise a public employment," "a sort of public office," and is held to certain duties to the public. Among those duties is to store whatever he holds himself out to store, for a *reasonable* hire. This is his common law duty, and he has no right to say that he will not discharge that duty, except he goes out of business and leaves the field open to some one who will. But what is a reasonable compensation for any service is always, in the absence of legislation, a judicial ques-

tion. It is, therefore, manifest that when the National Transit Company arbitrarily fixed rates of charges for its services, it did so subject to judicial inquiry whether the rates so fixed were reasonable. And if the courts can determine the reasonable compensation for services already performed, *a fortiori*, the Legislature may prescribe reasonable compensation for future services.

It will be observed, moreover, that what is claimed to be a contract, is indefinite as to time. The patron of the company is not bound to leave his oil in the tanks one hour. He may terminate the bailment any moment, and there is consequently no contract binding him to pay the company storage at the rate of five-eighths of one cent per barrel for every fifteen days after this bill shall be enacted into a law. He stands in respect to the future in the same position as the man who has no oil in the line. The company says to both by its notice: "If we store oil for you next week or next year you must pay so much." But surely if the law steps in and fixes a lower charge nobody will pretend that the man who had no oil in their custody before the passage of the law will be bound to pay the old rate if he becomes a patron afterwards. Neither can it be pretended that the former patron cannot, under such a bailment as is stated, withdraw his oil after the passage of the law and the same instant require the company to receive it again at the legal rate. But the law never requires the enactment of a silly farce in order to secure its protection.

If it be thought, however, that there is anything here in the nature of a contract for future services in respect to the stock oil, the well considered observations of Judge Washington in *Ogden vs. Saunders*, 12 Wheaton, will, I think, effectually dispose of the contention that it is such contract as was within the contemplation of the framers of the Federal Constitution. After pointing out that it is the law which constitutes the obligation of a contract, and combatting the assumption of counsel that the framers of the Federal Constitution had in view the universal law of civilized nations, rather than the *lex loci contractus*, as entering into and forming part of the contracts which they designed to protect, that eminent jurist said:

"And if it be true, that this (the universal law) is exclusively the law to which the Constitution refers us, it is very apparent that the sphere of State legislation upon subjects connected with the contracts of individuals, would be abridged beyond what it can for a moment be believed the sovereign States of this Union would have consented to; for it will be found upon examination, that there are few laws that concern the general police of a State, or the government of its citizens in their intercourse with each other, or with strangers, which may not in some way or other affect the contracts which they have entered into or may thereafter form. For what are laws of evidence, or which concern remedies—frauds and perjuries—laws of registration and those which affect landlord and tenant, sales at auction, acts of limitation, and those that limit the fees of professional men, and the charges of tavern keepers, and a multitude of others which crowd the codes of every State, but laws which may affect the validity, construction or duration or discharge of contracts." And further on: "It is, then, the municipal law of the State, whether that be written or unwritten, which is emphatically the law of the contract made within the State, and must govern it throughout, wherever its performance is sought to be enforced." And again: "If, then, it be true that the law of the country where the contract is made, or to be executed, forms a part of that contract, and of its obli-

gation, it would seem to be somewhat of a solecism to say, that it does, at the same time, impair that obligation."

The common law of Pennsylvania which forms part of every contract for a public service is, as we have seen, that the Legislature may at any time fix the compensation for such service.

The next objection, in order, is to the provision of the bill that more than two per centum of the oil delivered to the pipe company shall not be deducted for water, etc. This objection overlooks the fact that it is not the duty of the pipe company to receive anything into its pipes and tanks except pure petroleum. The friends of the bill think that while the pipe company may lawfully and ought to reject everything but good merchantable oil, they ought not to receive water or gas from one patron and make a reduction of more than two per cent. from another's merchantable oil to make up the loss. You repeat the eighth commandment without qualification to private citizen. All that you are asked to say to the National Transit Company is: "Thou shalt not steal more than two per cent."

Finally it is said that the bill is unconstitutional because it requires pipe companies to store oil free of charge for thirty days. This is hypercriticism. The thirty days storage is part of the service for which fifteen cents per barrel is allowed. The bill has been so reconstructed as to leave no doubt upon that point.

THE PUBLIC WELFARE REQUIRES A LIMITATION OF THE CHARGES FOR TRANSPORTATION AND STORAGE.

The Legislature having power over the subject matter, and the bill being free from constitutional objections, ought it to be enacted into a law?

You have heard from gentlemen much better qualified to speak upon the subject than I am that ten cents per barrel would be remunerative of the service of receiving, storing for thirty days, transporting fifty miles and delivering crude petroleum, and that lower rates for storage than those named in the bill would yield a handsome profit; and if the statements have been publicly denied, I have not heard the denial. And you have learned from the same source that the National Transit Company has a virtual monopoly of this business, the so-called "independent pipe lines" being unworthy of the name of competitors; that it exacts twenty cents per barrel for the same service that can be rendered for ten cents, and makes even more extortionate demands for storage service; and that the Standard Oil Company owns or controls the National Transit Company, and is directly or through intermediate agencies, the principal refiner of and dealer in petroleum.

Under such circumstances, there would seem to be no room for doubt in respect to the duty of the Legislature to put a limit to what must appear to be extortion. But it is said, "Oh, the producers don't pay these charges; they come off the consumers," as if there was some peculiar merit in making the poor man's light costly. I have, however, always understood that it was the producer's interest to reach the consumers at a minimum cost. But let us see whether the excessive toll that is exacted from every barrel of crude oil is not that which struck down and keeps down what once promised to be a great industry in Pennsylvania, the refining business.

In January, 1872, a corporation called the South Improvement Company entered into contracts with all the trunk line railroads having connections with the oil regions, by which the railroad companies agreed among other things:

To transport and deliver petroleum and its products

over the railroads of the party of the second part and its connections, at gross rates, which shall at no time exceed the following, without the consent of both parties hereto:

From any point on the Oil Creek & Allegheny River Railroad to Oil City, Union, Corry, or Irvineton, which are herein designated as *common points*, on each barrel of 45 gallons in bulk, and on each barrel of 47 gallons in barrels...\$0 30

ON CRUDE PETROLEUM.

From any common point to—				
Cleveland for each barrel of 45 gallons	.....	\$	80	
Pittsburgh " " "	.....		80	
New York " " "	.....		2 56	
Philadelphia " " "	.....		2 41	
Baltimore " " "	.....		2 41	
Boston " " "	.....		2 71	

From all other points—except those on the Oil Creek & Allegheny River Railway—to the six places of destination last named, the same rates as from the *common points*.

ON REFINED OIL, BENZINE AND OTHER PRODUCTS OF THE MANUFACTURE OF PETROLEUM.

From Pittsburgh to New York, for each barrel	.....	\$2	00
" " Philadelphia, " "	.....	1	85
" " Baltimore, " "	.....	1	85
" Cleveland to Boston, " "	.....	2	15
" " New York, " "	.....	2	00
" " Philadelphia, " "	.....	1	85
" " Baltimore, " "	.....	1	85
" any common point to New York, for each barrel	.....	2	92
" " Philadelphia, " "	.....	2	77
" " Baltimore, " "	.....	2	77
" " Boston, " "	.....	3	07

From and to all points intermediate between the points aforesaid, such reasonable rates as the party of the second part shall from time to time establish, on both crude and refined.

From Pittsburgh to Cleveland, and other points, to places west of Pittsburgh and Cleveland, such reasonable rates as the party of the second part may deem it expedient from time to time to establish.

To pay and allow to the party hereto of the first part, on all petroleum and its products transported for it over the railroads of the party of the second part and its connections, the following rebates, and on all transported for other parties, drawbacks of like amounts as the rebates from the gross rates, the same to be deducted and retained by the party hereto of the first part for its own use from the amounts of freights payable to the party of the second part.

ON THE TRANSPORTATION OF CRUDE PETROLEUM.

From the gross rate from any common point to—			
Cleveland, a rebate per barrel of	.....	\$0	40
Pittsburgh, " " "	.....		40
New York, " " "	.....		1 06
Philadelphia, " " "	.....		1 06
Baltimore, " " "	.....		1 06
Boston, " " "	.....		1 06

From the gross rate from all other points to the six places of destination last named, rebates the same as on the rates from the *common points*.

ON TRANSPORTATION OF REFINED OIL, BENZINE AND OTHER PRODUCTS OF THE MANUFACTURE OF PETROLEUM.

From the gross rates from—			
Pittsburgh to New York, a rebate per barrel of	.....	\$0	50
" " to Philadelphia, " "	.....		50
" " to Baltimore, " "	.....		50
Cleveland to Boston, " "	.....		50
" " to New York, " "	.....		50
" " to Philadelphia, " "	.....		50
" " to Baltimore, " "	.....		50
From the gross rates of any common point to—			
New York, a rebate per barrel of	.....	1	32
Philadelphia, " " "	.....	1	32
Baltimore, " " "	.....	1	32
Boston, " " "	.....	1	32

From the gross rates to and from all points intermediate between the above points a rebate or drawback of one-third of the gross rate shall be paid.

From the gross rates from Pittsburgh, Cleveland, and other points, to places west of the meridians of Pittsburgh and Cleveland, a rebate or drawback of one-third of the gross rate shall be paid.

The man must be stupid indeed who cannot see that if these contracts had remained in force, citizens of Pennsylvania would have engaged in the oil business precisely to the extent, and with the results that the South Improvement Company willed. But the conspiracy leaked out; a storm of indignation followed which reached the halls of the Legislature, and the charter of the company was repealed. The principle of dis-

This is exclusive of the oil run by the Pittsburgh Pipe Lines, which receive over 1200 barrels a day from Butler county.

The Rockland or Red Valley district, in Venango county, commenced running oil in October, 1885, and up to the 28th of February had produced 437,458 barrels; a daily average for 516 days of 848 barrels.

The Tarkill pool in Venango county averaged 427 barrels a day in March, 764 barrels a day in April, 915 barrels a day in May, 1262 barrels a day in June, 4038 barrels a day in July, 3756 barrels a day in August, 2258 barrels a day in September, 1009 barrels a day in October, 920 barrels a day in November, 853 barrels a day in December, 764 barrels a day in January and 730 barrels a day in February. The Excelsior Pipe Line commenced running oil from this field in September, and its runs are not included in the preceding figures. The Pontius or McKeever pool, in Butler county, produced 57,609 barrels in February, 71,710 barrels in January, 76,645 barrels in December, 82,962 barrels in November, 90,777 barrels in October, 84,126 barrels in September, 85,331 barrels in August, 70,458 barrels in July and 70,489 barrels in June.

The runs from the Tipperary district in Venango county were 4800 barrels in October, 6156 barrels in November, 5324 barrels in December, 5543 barrels in January and 5385 barrels in February.

Crude Market for February.

The petroleum market continues dull in the extreme and the business transacted is very light. While the field situation has become more bullish, on account of decreased activity in all sections, a few large wells at Reibold, in Butler county, attracted the attention that was formerly devoted to Washington and Shoustown. The white sand pool is still the evil genius of the oil market, and scarce has one been retired to the rear by active drilling than another springs up to take its place.

The month opened at the highest point, 69½¢, at which figure some trading was done at Oil City and Bradford. At New York the opening quotation was 69c and at Pittsburgh 69¼¢, and at both these places an advance to 69¾¢ was at once made. But a weakness soon set in and the general tendency was downwards with slight reactions. On the 16th it dropped below the 60c point, sales being made at 59¾¢ at Bradford, and at 59¼¢ at Oil City. These were the lowest figures of the month. After this there was a small advance that carried prices up to 66c on the 23d, but the boom was short lived and the month closed with quotations at 61½¢ and 61¼¢. The highest price for January was 72½¢ and the lowest 67¾¢.

The range of prices for February was 9¾¢ as compared with 4¾¢ in January, 16¾¢ in December, 14½¢ in November, 4¾¢ in October, 4¾¢ in September, 6½¢ in August, 3¾¢ in July, 8¾¢ in June and 12½¢ in May. The average price on the floor of the Bradford Exchange was 63¾¢ in February, 71c in January, 71c in December, 72c in November, 65½¢ in October, 63¾¢ in September, 62c in August, 66c in July, 67c in June, 69¾¢ in May, 74c in April, 77½¢ in March and 80c in February. The average price for February one year ago was 80c.

THE CLEARANCES.

	February. B.rels.	January. Barrels.
Bradford Oil Exchange	27,940,000	26,170,000
Oil City	50,172, 00	53,746,000
New York Consolidated Exchange.....	124,433,000	111,951,000
Pittsburgh Petroleum Exchange, est.....	59,940,000	51,634,000
Philadelphia Oil Exchange, est.....	18,000,000	17,159,000
Total	280,403,000	260,000,000

THE PRODUCING REGION.

At the beginning of February there were 78 new rigs and 196 drilling wells in the New York and Pennsylvania oil region, a total of 274. The number of wells completed in February was 147, with an estimated new production of 8061 barrels. The dry holes numbered 24, leaving 123 productive wells with an average yield of 65½ barrels. During January the entire region completed 122 productive wells and 37 dry holes, and the average of the new wells was a little above 30 barrels. The average of the December wells was 30 barrels, of the November 31, of the October 30, of the September 62 and of the August 48 barrels. The February figures show a decrease of 12 wells and an increase of 4354 barrels new production, while January decreased 30 wells and 419 barrels new production. The increase for February comes from the new discoveries at Reibold, in Butler county. At the close of February there were 66 new rigs, 120 old rigs and 172 drilling wells in the entire region, a total of 358, as compared with 78 new rigs 124 old rigs and 196 drilling wells, a total of 398 at the close of January. This is a decrease of 12 new rigs, 4 old rigs and 24 drilling wells, or a total decrease of 40 in active operations. January showed a decrease of 48 from December and December of 95 from the November figures. At the close of February, 1886, the record showed 269 new rigs, 188 old rigs and 367 drilling wells, a total of 754.

ALLEGANY FIELD.

But five wells were completed within the confines of the Allegany field in February, and two of these were gassers. The new wells are very small and average about 6 barrels each. The gas wells were drilled, one by the National Transit Company, on lot 61, Wirt, and the other by the Lane Oil Company, on lot 5, Clarks-ville. Phalen & Co. likewise found a gas well near Sharon, in Potter county. New work at the close of the month consisted of 5 rigs and 6 drilling wells. Willets & Co. have a well near the sand in Birdsall township, which has attracted some attention by making a good gas show. The Allentown Oil Company have a wild-cat well under way on the L. G. Norton farm, lot 46, Scio. The pipe line runs averaged 4949 barrels a day in February, 4920 in January, 5072 in December, 5260 in November, 5885 in October, 6035 in September, 6333 in August, 6802 in July and 6981 in June. The average daily runs for February one year ago were 6361 barrels; for February, 1885, 7696; for February, 1884, 12,025, and for February, 1883, 13,152.

THE BRADFORD FIELD.

At one time in the history of the great northern oil basin it was no uncommon thing to complete in a single day as many new wells as are now completed in an entire month. Twelve productive wells were finished in February, against the same number in January. A single dry hole was found, which was located on the Mack lands, west of Bradford, and drilled by the Manufacturers' Gas Company. At the close of the month there were 9 new rigs and 9 drilling wells in the field, as compared with 9 new rigs and 14 drilling wells at the close of the month preceding. The pipe line runs of the Bradford field averaged 22,680 barrels a day in February, 23,133 in January, 24,002 in December, 24,690 in November, 24,596 in October, 26,394 in September, 26,785 in August, 27,587 in July and 28,790 in June. For February, 1886, the runs were 27,499 barrels; February, 1885, 27,480; February, 1884, 33,987; February, 1883, 33,481, and for February, 1882, 63,313.

WARREN AND FOREST.

There were 37 wells completed in the Middle field in February, including 4 which were non-productive of oil, and the new production was 773 barrels. This is a decrease of 2 wells and an increase of 513 barrels production, as compared with the figures for January. On the last day of February the field showed 20 new rigs, 20 old rigs and 30 drilling wells, against 21 new rigs, 23 old rigs and 30 drilling wells on the last day of January.

KINZUA VILLAGE.—The developments on the west side of the river at Kinzua are proving more interesting. One of the wells struck in February started at 65 barrels an hour, and made nearly 1000 barrels in twenty-four hours. Up to the first of March 20 wells had been drilled west of the river, and their total yield was 1600 barrels. Collins, Heasley & the McCalmont Oil Company owned seven of these, Collins, Heasley & Morse seven and Smith, Bright & Co. six. The largest wells are located along Willie's run, on warrant 5563, and land has been leased several miles in advance. The belt at present seems very narrow, and several dry holes on the southwest will prevent its having any great length. Barnsdall, Sill & Odell are drilling a test near the northwest corner of warrant 5564, on a good southwest line, while the firms who have drilled all the productive wells are inclined to push the development more directly to the westward. A theory has been advanced that the belt will connect up with the heavy gas streak on Hemlock run, at the northeast end of the Wardwell district.

Clarendon and Tiona continue to furnish a small amount of territory that is attractive to a few operators. J. A. Waterhouse & Co., after completing nine wells on their Cornen purchase, lot 556, have practically suspended drilling with five rigs up ready to swing the tools at any time. Fertig, McKinney & Co. and Horton, Crary & Co. keep a few strings of tools busy at all seasons and under pretty nearly all circumstances. The Forest Oil Company completed a single well on lot 4, of the Cooper tract, (warrant 2991), which is the only new well finished in this district in several months. At Balltown Horton, Crary & Kraeer are drilling No. 2, on lot 741, and J. C. Welsh is doing a little work on the southwest edge of the old pool.

KANE.—The production of the Kane field, as shown by the pipe line runs, averaged 2628 barrels a day in February and 2956 barrels in January. On the extreme northern end of the field a good well was struck on lot 341, which appears to indicate additional territory in this direction.

The Grand Valley production has declined to 1425 barrels a day. There was little done the past winter in this district, save in the line of mapping out a large amount of new work for the spring campaign. The little field enjoys the benefits of three pipe lines, two of which, however, do little more than pipe oil from the wells of their owners. Myron Dunham & Co. opened up a well at Enterprise, on lot 133, which has been shut down for several months, and which is rated as an eight barreller. The McConnell well, at Torpedo, on lot 328, proved a failure. The north end of the district is to be more thoroughly explored. The Reno Oil Company, Boiles & Roberts and McConnell & Co., will drill more wells the coming spring. Porter & Gilmore drilled a duster on the W. Thompson farm, near Titusville. W. P. Black is very industrious about Pleasantville, having completed three new wells the past month.

THE WILD-CATS.—Elk county developed nothing of importance during February. No wells were completed and work at present is confined to filling out conditions

stipulated in leases. Clark & Foster hold a large area of territory, on every 500 acres of which they are obliged to drill two wells. They have two wells now drilling. In the Hickory district Taylor, Torrey, Murphy & Wolcott, have another test started. The second venture of the Shannon syndicate, in Forest county, is reported to have a showing of oil.

THE LOWER COUNTRY.

There were 91 wells completed in the Lower country in February, and 16 of them were dry of oil; the new production is rated at 7190 barrels. The great increase which brings the average of the 75 productive wells up to 96 barrels apiece comes from a few gushers at Reibold, in Butler county. On the 28th day of February the Lower country had 32 new rigs, 35 old rigs and 127 drilling wells, as compared with 78 new rigs, 124 old rigs and 196 drilling wells on the 31st of January.

VENANGO.—Little of interest is at the present moment to be noted in the Venango field. Only 23 wells were completed the past month and the new production was but 111 barrels. January completed 32 new wells with a production of 189 barrels. The Reno Oil Company found a nice little producer on lot 5, of the Lloyd lands, a half mile in advance of the Tarkill district. It is rated at 6 or 8 barrels a day, and seems to mark the beginning of something distinct from the Tarkill pool. Venango sums up 13 new rigs and 27 drilling wells for the close of the month.

BUTLER AND ARMSTRONG.

The Reibold pool astonished the trade in February by showing at its highest point a production of 9000 barrels per day, and the capability of affording wells which would flow 100 barrels of oil per hour, while being agitated by the drill. There has been no marked change in the territorial outlines of the third sand pool, although the Phillips & Lenz well, on the Gelbach farm, on the north side of the P. & W. R. R., is producing 100 barrels of oil daily from the 100-foot. Phillips & Osborne's No. 5, on the C. Markle farm, about 1200 feet south of No. 1, on the same farm, started at 50 barrels per hour on the evening of the 11th when seven feet in the sand, and when twenty-eight feet in the rock, on the afternoon of the 12th was producing 25 barrels per hour. The dispatches from the scouts on Monday morning, the 14th, place the production of the well at 8 barrels per hour. Major Phipps, who has charge of the producing wells of Phillips & Osborne, expressed the opinion that the well was on the edge on account of it having the same characteristics as No. 4, which is on the northern edge of the streak and on the same farm. The Blakeley and Heid farms are sub-divided into small leases and are being too closely drilled for the wells to have good staying qualities. The No. 3 well, on the C. Markle farm, 200 feet south of the P. & W. R. R., and about 800 feet west of the eastern line of the farm, was such a heavy gasser that drilling had to be stopped for the gas to weaken when the drill was five feet and ten feet in the sand. Leidecker Bros'. No. 4, on the Heid farm, situated on the east side of Glade run, and about 500 feet up this creek from the railroad trestle, frequently ran its production up to 100 barrels per hour, while being agitated by the drill, but its settled gait at this time was about 60 barrels per hour. Thus far it is the best well that has been found in the rich pool, and on Saturday, March 12th, was down to 20 barrels per hour. Will Coast, of Olean, is putting his theory of a southern drift of the crude currents to a test by drilling a well in advance of the producing wells on the Blakeley farm. H. H. Stow & Smick's well, on the Miller farm, and

Phillips & Osborne's venture, on the Markle farms, are the important wells now drilling immediately in advance of developments. North of Callery Junction the Breakneck Oil Company are toying with the fates again by drilling a test well on the western side of the W. Goesing farm. The wild-catter and land scalper are busy scouring the county in range with the pool and a long ways to the southwest.

The following is the production of the wells in the Reibold pool for the twenty-four hours ending on the morning of March 12, 1887:

Farm.	Operator.	No.	Barrels.
Critchlow, T. W. Phillips & Osborne,		No. 1.....	33
"	"	No. 2.....	25
"	"	No. 3.....	broken down
Slater,	"	No. 1.....	35
"	"	No. 2.....	55
"	"	No. 3.....	45
"	"	No. 4.....	53
Spithaller,	"	No. 1.....	35
"	"	No. 2.....	55
"	"	No. 3.....	45
"	"	No. 4.....	53
Heid,	"	No. 1.....	40
"	"	No. 2.....	60
"	"	No. 3.....	240
"	"	No. 4.....	160
"	"	No. 5.....	100
"	"	No. 6.....	10
Markle,	"	No. 1.....	100
"	"	No. 2.....	315
"	"	No. 3.....	675
"	"	No. 4.....	230
"	"	No. 5.....	600
Blakeley,	"	No. 1.....	375
"	"	No. 2.....	540
Gelbach, Phillips & Lenz,		No. 1.....	110
Critchlow, Leidecker Bros.,		No. 1.....	80
Heid,	"	No. 2.....	60
"	"	No. 3.....	40
"	"	No. 4.....	480
"	"	No. 5.....	60
"	"	No. 6.....	25
" Gum Boot Oil Co.,		No. 1.....	40
Blakeley, Leidecker Bros.,			336
Critchlow, Gibson & Co., est.,			40
Wells.....			34
Production.....			5150

The average daily pipe line runs from the field for February, by the National Transit and Pittsburgh lines, were about 6000 barrels, an increase over January of 3200 barrels.

SHANNOPIN.

The Solar Oil Company and Raccoon Oil Company's No. 21, on the Morrow farm, proved to be a prolific scratch well to the owners and caused the field to again pass in review before the speculators. It is surrounded by wells of a small calibre and does not open up new territory. It is south of the old Marks, No. 1, and is about the third location from the north side of the Morrow farm on the second row of wells on the eastern side. It is reported to have done over 2000 barrels in its best twenty-four hours, and the gauge for the twenty-four hours ending March 11th was 1507 barrels. The Forest Oil Company's well, on the McKee farm, near Oakdale Station, on the Pan Handle Railroad, is being worked as a mystery and has flowed oil from the Gantz sand. One of the three wells drilling in the Mount Nebo country, by the Union Oil Company, was completed in February and found to be dry.

WASHINGTON.

Interest in the old Washington field has waned since the AGE's last report was made, and hardly a single new well has attracted the attention of the speculative trade. The Taylorstown field, between six and seven miles west of Washington borough, has supplanted the Smith and Gordon pools in the eyes of oilmen and is the new territory whose outlines remain to be pencilled by the drill. The pioneer well of the Taylorstown field is located pretty well toward the southern boundary line of the John McMannis farm, about a mile and a quarter north of the village of Taylorstown, and two miles in an air line from the B. & O. depot. To T. J. Vandergrift

falls the credit of leasing the land and making the location. They began to build the rig about the middle of November, 1885, and the drill was started on the 6th of January, 1886. On the 6th of July, just six months from the day drilling was begun, oil was struck. The well was mystified until the 26th of July, when it was opened up and produced 105 barrels in its best twenty-four hours. It declined to a point below 50, and after being packed and tubed, produced above 75 barrels per day for quite a long time, and is still doing over 50 barrels per day. The Natural Gas Company of West Virginia have completed three wells, and other parties have finished two more, making together five wells since oil was struck in the pioneer producer. The wells on the Carson, Blayney, McMannis, Noble and Cundall farms are practically on a forty-five degree line running in a northeasterly and a southwesterly direction, and demonstrate the existence of a streak of oil at least two miles in length. The well on the Donaldson farm, along Brush run, two miles northeast of the old Taylorstown well, is a heavy gasser, and the wells producing oil lie southwest of this gasser. The Carson farm well, the most northeasterly of the oil wells, had a thin sand and made a showing of oil and gives every indication of being an edge well. The Gordon sand, which is the oil bearing rock in this field, was struck at this well at a depth of 2614 feet. The well was drilled over 2700 feet deep, but failed to find the fourth or sand below the Gordon sand, which affords the gas at the well on the Price farm, west of the Gordon pool. At first this well was rated a failure, but during the week ending March 12th the owners concluded to tube it and the well has since made a flow. The well on the northwestern corner of the Samuel Blayney farm is owned by Hart Bros. & Co. It struck the sand at 2458½ feet, and in its best twenty-four hours flowed 225 barrels through the casing. This well is 806 feet southeast of the McMannis farm well. The Noble farm well, southwest of the old well, and nearly on a forty-five degree line with it, had the best sand and is the largest well that has been found in the Taylorstown field. It started at 20 barrels per hour and in its best twenty-four hours produced nearly 300 barrels. The Cundall farm well, situated on the south side of Buffalo creek, and about three-quarters of a mile southwest of the pioneer well, produced over 200 barrels per day when doing its best, after being packed. It is on the low ground of the field and the sand was struck at a depth of 2325 feet. At this well the sand is thinner and the oil is darker than the oils found at the other wells in the field. It has some indications of being near some edge of the field. J. B. Aiken, Stone & Hazeltine's wild-cat well, on the Samuel Sheller farm, a mile and a quarter northwest of the Cundall well, and a mile and three-quarters west of the McMannis well, is the most important well that has been drilled since oil was first struck on the circuitous Buffalo creek. It is situated on the east side and near the mouth of a creek which winds its way through a narrow valley, which bears the unromantic name of Polecat Hollow. The well is located on the eastern side of the creek and a short distance above its confluence with Buffalo creek. At this writing, March 12th, the casing is leaking and drilling has been stopped 100 feet above the Gordon sand level until it can be made tight. The oil of the Taylorstown section is of a dark, green color and resembles that found in the Shannopin field, and in some parts of Butler county. The Natural Gas Company of West Virginia, who have drilled the wells on the McMannis, Donaldson, Carson and Noble farms, have the lion's share of the territory

in sight, and will time the movement of the drill at a moderate speed. The sand is so thin that the territory will not stand close drilling. Hart Bros. & Co., who are operating the Sam Blayne farm, have agreed to limit their drilling to seven wells on 104 acres. The form which the Taylorstown field will assume when outlined, and the extent of the territory which it will comprise, can only be determined by time and the centre bit.

Below is a list of all wells in the field which were producing February 12th, with their production on that date and the same wells with new ones added to the list with their yield on March 12th:

Farm.	Operator.	Prod. Feb. 12. Barrels.	Prod. Mar. 12. Barrels.
Gordon, P. L. & H. Co.,	No. 1	16	10
"	No. 4	9	18
"	No. 5	26	20
"	No. 6	480	131
Hess,	No. 2	6	5
"	No. 3	10	7
"	No. 4	8	6
Gantz, Citizens' Oil & Gas Co.,	No. 1	30	28
Weaver,	No. 3	8	9
Weirich, Forest Oil Co.,	No. 1	10	
"	No. 2	12	
Hall,	No. 1		55
"	No. 2	10	
"	No. 3	10	
"	No. 4		
Barre,	No. 1	30	
"	No. 2	78	
"	No. 3	90	
"	No. 4	80	
"	No. 5	125	
"	No. 6	420	688
"	No. 7		
"	No. 8	45	
"	No. 9	40	
"	No. 10		
"	No. 11	50	
Taylor, Union Oil Co.,	No. 1	40	45
"	No. 2	40	20
"	No. 3	35	80
"	No. 4	35	25
"	No. 5	50	45
"	No. 7	25	30
McGovern,	No. 1	23	25
Clark,	No. 1	7	5
Dye lot,	No. 1	45	50
Morgan,	No. 1	40	30
"	No. 2	10	10
"	No. 3	12	10
"	No. 5	65	55
"	No. 6	10	10
Davis,	No. 1	50	80
"	No. 2		90
"	No. 3	40	35
"	No. 4	210	110
Davis, Union Oil Co.,	No. 5	25	25
"	No. 7	1020	500
Linn, Coast & Co.,	No. 2	50	48
"	No. 3	15	20
"	No. 4	25	28
Weirich,	No. 1	14	13
Hayes,	No. 1	7	7
Lead Works Lot, McKeever & Mulholland,	No. 1	22	15
"	Marsh & Caldwell,	No. 1	12
Smith, Willets, Young, Craig & Co.,	No. 1	6	6
"	"	No. 3	20
"	"	No. 5	17
"	"	No. 6	16
"	"	No. 7	21
Cameron,	No. 1	17	23
"	No. 2	5	5
"	No. 3		
"	No. 4	132	144
"	No. 5	161	148
"	No. 6	41	34
"	No. 7	119	97
"	No. 8		
Shirls, Shirls,	No. 1	25	60
"	No. 2	15	60
"	No. 3	3	
Stewart, Fisher Oil Co.,		24	94
Miller, Guffey & Co.,	No. 1	40	42
Hall, Guffey & Co.,	No. 1	5	5
Manifold, Pew & Emerson,	No. 1	15	6
"	No. 2	52	60
Gabby,	No. 1	5	5
Clark, Thayer & Co.,	No. 1	29	22
"	No. 2	157	68
"	No. 3	26	22
"	No. 4	40	20
Clark, Thayer & Co.,	No. 5	25	10
"	No. 6		11
Munce, Willets & Son,	No. 1	58	42
"	No. 2	1	1
"	No. 3	24	20
"	No. 4		
Muncie, Willets & Son,	No. 5		
"	No. 6		152
"	No. 7	52	61
"	No. 8	50	29
"	No. 9	30	
"	No. 10		50
"	No. 11		27

Farm.	Operator.	Prod. Feb. 12. Barrels.	Prod. Mar. 12. Barrels.
Munce, Willets & Son,	No. 12	40	25
"	No. 13	20	15
"	No. 14		
"	No. 15	300	150
"	No. 16	40	50
"	No. 17	50	36
"	No. 19	50	50
"	No. 20		
"	No. 21	30	38
"	No. 22		35
"	No. 27	100	70
Montgomery, J. L. McKinney & Co. & Robbins,	No. 1	9	16
"	No. 3		12
Taylor, Galligan & Co.,	No. 1	40	30
"	No. 2		40
Clark, Hallam & Co.,	No. 1	5	6
Wiley, Munhall & Co.,	No. 1	10	2
"	No. 2	7	10
Munce, John McKeown,	No. 1		
"	No. 2		
"	No. 3		
"	No. 4		
"	No. 5		
"	No. 6		
"	No. 7		
"	No. 10		
"	No. 11		
Martin,	No. 2		
"	No. 3		
Quail,	No. 1		
Fergus, Chartiers Oil Co.,		36	17
Fair Ground, Wheeling Oil Co.,	No. 1	90	70
Fair Grounds, Wheeling Oil Co.,	No. 2	40	60
"	No. 3	12	
Zelt, Associated Producers,	No. 2	5	3
Wiley, Associated Producers,	No. 2		10
Martin,	No. 1	30	20
Curry,	No. 1	22	15
Miller, Reed & Co.,		25	
Weaver, Hart Bros.,		30	9
Martin, Central Oil Co.,	No. 1	65	50
"	No. 3		100
Wade, B. B. Campbell,		115	70
Thome, Andrews & Connors,	No. 1	10	8
"	Lec & Shank, No. 1	65	50
"	No. 2		85
McGahey, Mascot Oil Co.,	No. 1	50	18
"	No. 5	264	220
"	No. 6		190
"	No. 7	25	15
Wright, Craig & Andrews,	No. 1	14	44
"	No. 4	240	64
"	No. 5		236
Van Kirk, Caldwell & Co.,	No. 1	3	4
McKean,	No. 1	20	24
Whittlesee,	No. 1		150
Watson, Butler & Co.,	No. 1	40	20
"	No. 2		15
Martin, Allen & Co.,			10
TAYLORSTOWN.			
McMannis, West Virginia Natural Gas Co.,		70	60
Blaney,			175
Noble,			220
Cundall, Vandergrift & Co.,			168
Date.			
February 12, 1887.		No. wells.	Production Barrels.
		140	7,385
March 12, 1887.		155	7,358
Difference		15	27

SUMMARY of the Statement of the Tidewater Pipe Company, Limited, for February, 1887:

Quantity of crude petroleum in custody at beginning of February	Barrels.	1,443,538.64
Quantity of crude petroleum at close of Feb.	1,600,985.36	
Less sediment and surplus	159,372.36	
	1,501,613.00	
Receipts during February	160,971.27	
Received in iron tanks	51,972.13	
Deliveries during February—to refiners	152,238.93	
" " to other parties	152,238.93	
Outstanding certificates, accepted orders, etc.	751,000.00	
Credit balances	750,613.00	
Total liabilities February 23, 1887.	1,501,613.00	
JANUARY SUMMARY.		
Quantity of crude petroleum in custody at beginning of January	Barrels.	1,369,422.08
Quantity of crude petroleum at close of Jan.	1,594,561.49	
Less sediment and surplus	151,022.85	
	1,443,538.64	
Receipts during January	186,466.74	
Received in iron tanks	59,854.56	
Deliveries during Jan.—to refiners	168,401.06	
" " to other parties	168,401.06	
Outstanding certificates, accepted orders, etc.	719,000.00	
Credit balances	724,538.64	
Total liabilities, January 31, 1887.	1,443,538.64	

J. H. OBERLY, of Oil City, has contracted for a new rig to be put up at Pithole, over one of the old wells which he intends deepening to the Speechley sand. Northeast of the old pool Duke & Applebee have a rig up on the Blank farm.

FIELD OPERATIONS SUMMARIZED.

WELLS COMPLETED, WITH THE ESTIMATED PRODUCTION ON THE LAST DAY OF THE MONTH.

ALLEGANY FIELD.

Division of Field.	FEBRUARY, 1887.			JANUARY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Scio.....	0	0	0	0	0	0
Alma.....	0	0	0	1	4	0
Wirt.....	2	5	1	2	6	0
Bolivar.....	0	0	0	0	0	0
Clarksville.....	3	14	1	1	15	0
Genesee.....	0	0	0	0	0	0
Miscellaneous.....	1	0	1	0	0	0
Total.....	6	19	3	4	25	0

BRADFORD FIELD.

Division of Field.	FEBRUARY, 1887.			JANUARY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
E. and W. Branches.....	4	17	1	6	27	1
Kendall Creek.....	0	0	0	0	0	0
Foster Brook.....	2	18	0	2	15	0
Knapp's Creek.....	3	15	0	1	0	1
Four Mile.....	0	0	0	0	0	0
Indian & Meeks Creeks.....	3	21	0	4	30	0
Cole Creek.....	0	0	0	0	0	0
Kinzua.....	1	8	0	1	5	0
Miscellaneous.....	0	0	0	1	0	1
Total.....	13	79	1	15	77	3

WARREN AND FOREST.

District.	FEBRUARY, 1887.			JANUARY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Glade.....	5	564	1	5	75	2
Clarendon.....	10	51	0	9	31	2
Tiona.....	4	20	0	8	42	0
Cooper.....	1	10	0	0	0	0
Balltown.....	1	10	0	0	0	0
Kane.....	6	65	0	3	30	0
Grand Valley.....	8	49	2	7	49	0
Miscellaneous.....	2	4	1	7	33	3
Total.....	37	773	4	39	260	7

LOWER COUNTRY.

District.	FEBRUARY, 1887.			JANUARY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Venango.....	23	111	4	32	189	13
Clarion.....	8	38	2	8	55	2
Butler and Armstrong.....	33	5123	4	27	921	5
Washington.....	20	1645	4	14	1887	3
Shoustown, Etc.....	7	275	2	20	293	4
Total.....	91	7190	16	101	3345	27

GRAND SUMMARY.

District.	FEBRUARY, 1887.			JANUARY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Allegany.....	6	19	3	4	25	0
Bradford.....	13	79	1	15	77	3
Warren and Forest.....	37	773	4	39	260	7
Lower Field.....	91	7190	16	101	3345	27
Total February.....	147	8061	24	159	3707	37
Total January.....	159	3707	37			
Difference.....	12	4354	13			

Rigs Up and Building—Wells Drilling.

ALLEGANY FIELD.

Division of Field.	FEB. 28, 1887.				JAN. 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Scio.....	0	0	1	1	0	0	0	0
Alma.....	0	5	1	6	1	5	0	6
Wirt.....	1	9	1	11	0	10	2	12
Bolivar.....	0	2	0	2	0	2	0	2
Genesee.....	0	2	0	2	0	2	0	2
Clarksville.....	4	4	2	10	4	5	2	11
Miscellaneous.....	4	0	1	5	4	0	2	6
Total.....	9	32	6	47	9	34	6	49

BRADFORD FIELD.

Division of Field.	FEB. 28, 1887.				JAN. 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
E. and W. Branches.....	3	9	4	16	10	6	6	22
Kendall Creek.....	0	0	0	0	0	0	0	0
Knapp's Creek.....	1	8	0	9	3	7	2	12
Foster Brook.....	0	4	1	5	1	4	1	6
Four Mile.....	0	3	0	3	3	3	0	6
Indian Creek.....	1	5	1	7	2	4	3	9
Cole Creek.....	2	4	2	8	1	4	1	6
Kinzua.....	2	0	1	3	1	0	1	2
Miscellaneous.....	0	0	0	0	0	0	0	0
Total.....	9	33	9	51	9	32	14	55

WARREN AND FOREST.

Division of Field.	FEB. 28, 1887.				JAN. 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Glade.....	4	0	3	7	1	0	5	6
Clarendon.....	6	4	6	16	5	4	2	11
Tiona.....	3	2	5	10	3	5	2	10
Cooper.....	0	2	0	2	0	2	1	3
Balltown.....	0	2	2	4	1	2	2	5
Kane.....	1	2	3	6	1	2	2	5
Grand Valley.....	3	4	2	9	3	3	5	11
Miscellaneous.....	3	4	9	16	6	4	2	12
Total.....	20	20	30	70	21	23	30	74

LOWER COUNTRY.

Division of Field.	FEB. 28, 1887.				JAN. 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Venango.....	13	13	27	53	15	10	25	50
Clarion.....	3	8	9	20	7	8	8	23
Butler & Armstrong.....	3	4	33	40	29	7	45	81
Washington.....	2	8	38	48	6	7	51	64
Shoustown, Etc.....	5	2	20	27	6	3	17	26
Total.....	32	35	127	194	43	35	146	224

GRAND SUMMARY.

Field.	FEB. 28, 1887.				JAN. 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Allegany.....	9	32	6	47	9	34	6	49
Bradford.....	9	33	9	51	9	32	14	55
Warren and Forest.....	20	20	30	70	21	23	30	74
Lower Country.....	32	35	127	194	43	35	146	224
Total.....	66	120	172	358	78	124	196	398
Total Jan. 31.....	78	124	196	398				
Difference.....	12	4	24	40				

The Average Price of Crude.

The following table gives the average price of crude certificates, on the floor of the Bradford Oil Exchange, since March 1, 1879:

MONTH.	1879	1880	1881	1882	1883	1884	1885	1886	1887
January.....	110 1-5	95	83	92 3/4	111 1/2	70 3/4	88 1/4	71	63 3/4
February.....	103 1/4	89 1/2	85 1/4	101	104 3/4	73 3/4	80	77 1/2	63 3/4
March.....	86	89	82 3/4	80 3/4	97 1/2	100 3/4	80 3/4	77 1/2	63 3/4
April.....	78 3/4	76 3/4	84 1/2	78 1/4	92 3/4	94	78 3/4	74	63 3/4
May.....	73 1/2	80 1/4	81 1/2	70	99 3/4	85 1/2	79 3/4	69 3/4	63 3/4
June.....	68 3/4	100 1/4	81	54 1/2	117 1/2	68 3/4	82 3/4	67	63 3/4
July.....	69 3/4	101 1/4	76 1/2	57 3/4	108	63 1/2	96 3/4	86	63 3/4
August.....	67 1/4	90 3/4	78 3/4	58 3/4	108 3/4	81 1-5	100 3/4	62	63 3/4
September.....	69 1/4	95 1/2	92 3/4	71 1/2	112 3/4	78	100 3/4	63 3/4	63 3/4
October.....	88 3/4	96 3/4	92 3/4	93 3/4	111 1/2	71	105 1/2	65 1/2	63 3/4
November.....	105 3/4	91 1/4	82 1/4	114 3/4	114 4-5	72 1/2	104 3/4	72	63 3/4
December.....	113 3/4	92 3/4	83 3/4	95 1/4	114 3/4	74 3/4	89 3/4	71	63 3/4

THE city of Troy, N. Y., is supplied with fuel gas at 50 cents per thousand cubic feet. The process of manufacture is that of Prof. T. S. C. Lowe, of Norristown, Pa. The plant is the second one in the United States, erected for fuel purposes, the first being at Lynn, Mass. The gas is non-luminous, burning like alcohol, and with intense heat. In its manufacture water is the only material used. From 60,000 to 80,000 feet is made with a ton of coal, and the cost of manufacture is about 9 cents per thousand.

THE National Oil Company, of Titusville, composed of S. S. Henne, John Fertig, J. A. Cadwallader and others, have put down a two inch pipe line from Grand Valley to Titusville. A large refinery, with all the modern improvements, is being erected at Titusville, which will be completed early in April. The company has built about 40,000 barrels of iron tankage at Titusville and is at work constructing tank cars. It means to produce, pipe, refine and ship its own oil.

The Refined Market.

The refined market is still in an unsatisfactory condition. The foreign demand continues light and prices have again been marked down at the European ports. Quotations for 70° Abel test have not varied much from 6½c. Prices were marked down to 6½c and 6¾c for a few days, but the month closed fairly firm at the ruling figure.

William H. Samuel & Co., of Liverpool, under date of February 16th, say: Comparatively short supplies have had the effect of keeping prices in our market upon a high level since the commencement of the year. Circumstances have continually arisen to accentuate this position, and low prices have consequently been rendered impossible until practically the end of the season. Following upon the depleted visible supply caused by the loss of a cargo of American petroleum, stocks have been kept at almost dangerously small dimensions by the general delay which took place in the clearances of December and January cargoes from America, and to crown this state of things, the recent strikes in New York have resulted in further delay in the clearance of Liverpool shipments, the consequence of which is that there is barely sufficient oil in stock and afloat to last until well on into March. The arrival of several cargoes early this month brought about a decline in value of favorite brands from 7½d to 7d, and the market has since remained steady at this figure, which will in all probability be maintained until towards the end of March, if not advanced upon. Russian oil, after advancing in January to 6½d, declined again to 6d per gallon before the end of the month, and has since remained unchanged. Up to the present the trade have manifested a distinct preference for American oil over Russian oil, but if the former continued for any length of time to be much higher in price than the latter, the demand for American oil would probably rapidly dwindle to a low level, and as the facilities for the delivery of Russian petroleum from the seat of production are being slowly but surely perfected and cheapened, it would seem that a cheap supply of Russian oil in the future is certain, and such being the case American oil must be low too. It is, however, difficult to see how American oil can touch a lower level of prices than it has done occasionally during the present season.

The exports of refined, crude and naphtha, from all ports, from January 1 to February 26 have been as follows:

	1887. Gallons.	1886. Gallons.
From Boston.....	952,935	456,136
Philadelphia.....	16,647,766	14,939,335
Baltimore.....	1,483,989	1,948,800
Perth Amboy.....	2,073,883	350,944
Total.....	21,153,633	17,695,215
From New York.....	49,790,352	59,466,380
Total exports from United States...	70,948,985	77,161,595

The demand for refined for the home trade has fallen off somewhat with the advancing season, but prices show few changes. The following quotations are 8½@8¾c New York State legal test, 7½@7¾c for 110° test, 8¼@8½c for New York city 110° flash, and 9¾c for New York city 150° water white. Western lots are offered at 7½c for 110° test Standard white, 7¾@8c for 120° test Standard white, 8½@9c for 130° test Standard white, 9½@9¾c for Standard test and 9¾@9½c for 150° test water white. Western naphtha 68° to 72° test is quoted at 8½@9½c delivered in New York. The demand for refined in cases shows some improvement, with quotations of 8½ to 9¾c., according to brand. The clearances for February in this class of goods to China and the

East amounts to 733,626 cases, a decrease of 547,862 cases from the same month in 1886. The total clearances to February 28, 1887, are 1,324,847 cases, a decrease of 974,674 cases, as compared with the corresponding period of the year preceding.

Mr. George H. Lincoln's monthly circular gives the following figures on the clearances of refined petroleum, in cases, for China and the East up to the 28th of February, for the years 1886 and 1887:

	1887. Cases.	1886. Cases.
China.....	240,638	780,778
Japan.....	399,165	299,992
India.....	446,754	564,180
Java, Singapore, etc.....	238,290	654,571
Total February 28th.....	1,324,847	2,299,521
Total January 31st.....	591,221	1,018,033
Clearances for February.....	733,626	1,281,488
Clearances for January.....	591,221	1,018,033
Total.....	1,324,847	2,299,521

REFINED QUOTATIONS FOR FEBRUARY.

	New York.....	Philadelphia.....	Baltimore.....	London and Liverpool.....	Bremen.....	Antwerp.....
	Cts.	Cts.	Cts.	Pence.	Marks.	Francs.
1.....	6¼	6½	6¾	6¼	6.30	16¾
2.....	6¼	6½	6¾	6¼	6.30	16¾
3.....	6¼	6½	6¾	6¼	6.30	16¾
4.....	6½	6¾	6¾	6½	6.25	16¾
5.....	6½	6¾	6¾	6½	6.25	16¾
6.....	6½	6¾	6¾	6½	6.25	16¾
7.....	6½	6¾	6¾	6½	6.15	16¾
8.....	6½	6¾	6¾	6½	6.25	16¾
9.....	6½	6¾	6¾	6½	6.25	16¾
10.....	6½	6¾	6¾	6½	6.25	16¾
11.....	6½	6¾	6¾	5¾	6.15	16¾
12.....	6½	6¾	6¾	5¾	6.15	16¾
13.....	6½	6¾	6¾	5¾	6.15	16¾
14.....	6½	6¾	6¾	5¾	6.15	16¾
15.....	6½	6¾	6¾	5¾	6.15	16¾
16.....	6½	6¾	6¾	5¾	6.15	16¾
17.....	6½	6¾	6¾	5¾	6.15	16¾
18.....	6½	6¾	6¾	5¾	6.15	16
19.....	6½	6¾	6¾	5¾	6.10	16
20.....	6½	6¾	6¾	5¾	6.10	16
21.....	6½	6¾	6¾	5¾	6.10	16
22 Holiday.....	6½	6¾	6¾	5¾	6.05	15¾
23.....	6½	6¾	6¾	5¾	6.05	15¾
24.....	6½	6¾	6¾	5¾	6.00	15¾
25.....	6½	6¾	6¾	5¾	6.00	15¾
26.....	6½	6¾	6¾	5¾	6.00	15¾
27.....	6½	6¾	6¾	5¾	6.00	15¾
28.....	6½	6¾	6¾	5¾	6.00	15¾

SUMMARY of the Statements of the National Transit Company for February and January:

	February. Barrels.	January. Barrels.
Receipts from all sources.....	1,406,483.91	1,716,114.89
Deliveries.....	1,724,918.33	2,048,512.25
Gross stocks end of month.....	32,939,761.99	33,126,853.96
Sediment and surplus.....	3,559,721.32	3,424,316.87
Total liabilities end of month.....	29,380,040.67	29,702,537.11
Outstanding acceptances.....	22,401,039.08	22,566,039.08
Credit balances.....	6,979,001.59	7,136,498.01

The above "receipts from all sources" for February were made up as follows:

Runs from wells.....	1,251,786.12
Received from other lines.....	154,697.79
Total.....	1,406,483.91

The above "total deliveries" for February were made up as follows:

Regular shipments.....	1,672,946.20
Delivered to other lines.....	51,972.13
Total.....	1,724,918.33

The above "receipts from all sources" for January were made up as follows:

Runs from wells.....	1,395,510.24
Received from other lines.....	320,604.65
Received in iron tanks.....	
Total.....	1,716,114.89

The above "total deliveries" for January were made up as follows:

Regular shipments.....	1,988,657.69
Delivered to other lines.....	59,854.56
Total.....	2,048,512.25

Summary of Daily Pipe Line Runs for February and January, 1887.

The following table shows at a glance the pipe line runs for February and January and the increase or decrease from each section. The estimate for Baldridge is based upon the runs of the National Transit Company, which were 2825 barrels in February, and an approximate estimate of the Pittsburgh Pipe Line, which includes all the oil run from Butler county, under one head. In the Grand Valley district the runs of private lines are estimated at 180 barrels a day in February:

	Feb.	Jan.	Increase.	Decrease.
Allegheny.....	4,949	4,920	29	---
Bradford.....	22,680	23,133	---	453
Cherry Grove.....	248	196	52	---
Balltown.....	639	526	113	---
Cooper.....	403	458	---	55
Baldridge, estimated.....	6,025	2,800	3,225	---
Kane.....	2,628	2,957	---	329
Grand Valley.....	1,426	1,619	---	193
Tarkill.....	1,200	1,400	---	200
Tipperary.....	192	179	13	---
Red Valley.....	572	632	---	60
Pontius.....	2,057	2,313	---	256
Washington.....	6,318	6,930	---	612
Shannopin.....	2,045	2,250	---	205
Smith's Ferry.....	12	11	1	---
Macksburg.....	1,018	1,198	---	180
Other fields.....	12,159	12,305	---	146
Total.....	64,571	63,827	3,433	2,689
Total January.....	63,827	---	2,689	---
Increase.....	744	---	744	---

In addition to the above the runs of the Buckeye Pipe Line from the Lima field averaged 7394 barrels a day in February, 4226 barrels in January, 4374 barrels in December, 4038 in November and 4112 in October.

February Production Report.

Reports of the stocks on hand at 5000 Bradford wells showed an average increase of .5 barrels to the well during February.

The number of wells in the Bradford field connected with the pipe lines on the first of February is estimated at 14,050. Estimating the entire Bradford region on the basis of .5 barrels increase, the total increase in stocks at wells during February was 7012 barrels, a daily average of 250 barrels. Adding the increase in stocks to the total runs as reported by the National Transit and Tidewater pipe lines, Bradford's daily average production for February is as follows:

	Barrels.
Average Daily Pipe Line Runs.....	22,680
Average Daily Increase of Stocks at Wells.....	250
Bradford's February Production, estimated.....	22,930
January.....	23,269
Average Daily Decrease.....	339

THE ALLEGANY FIELD.

Stocks reported from the Allegheny field show an average increase of .7 barrels to the well, which gives a daily average increase of 100 barrels. This amount added to 4949, the average pipe line runs, places Allegheny's daily average production for February at 5049 barrels. The estimated production for January was 5563 for December 5178 and for November 5860 barrels a day.

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

Field.	No. Wells Feb. 1.	No. Wells March 1.	Average per well Feb. 1.	Average per well March 1.
Clarendon and Tiona.....	239	231	25	24
Cherry Grove.....	22	---	64	---
Cooper District.....	106	63	39	21
Lower Country.....	128	101	72	92
Miscellaneous.....	178	141	118	86

Accepting the outside runs, which are made up of the

producing fields outside of Bradford and Allegheny, as representing the production outside of those two fields, an estimate on the yield for February and January is as follows:

Field.	February. Barrels.	January. Barrels.
Bradford.....	22,930	23,269
Allegheny.....	5,049	5,563
Outside Runs.....	35,745	34,254
Total.....	63,724	63,086
Macksburg.....	1,061	1,343
Total with Macksburg.....	64,785	64,429
Increase per diem.....	356	---

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region. The runs from Washington are included with the outside field. The Lima runs by the Buckeye Pipe Lines were 7394 barrels a day in February, 4226 barrels in January, 4374 barrels in December, 4038 barrels in November and 4112 barrels in October.

The following table shows the comparative production for 1884, 1885, 1886 and 1887:

	Bradford.		Allegheny.		Outside Runs.		Total Prod.	
	1885.	1884.	1885.	1884.	1885.	1884.	1885.	1884.
January.....	28,675	31,806	8,260	11,264	18,594	16,140	55,529	59,240
February.....	27,051	32,378	7,196	11,607	19,800	18,561	54,047	62,546
March.....	26,444	31,912	7,342	11,768	19,923	19,764	53,709	63,444
April.....	27,413	32,442	7,169	11,848	23,067	19,162	57,649	63,452
May.....	27,231	33,922	7,049	11,547	21,225	19,549	55,505	65,018
June.....	29,272	33,753	7,463	11,108	21,559	19,977	58,294	64,833
July.....	30,309	34,031	7,139	11,218	19,273	20,870	56,721	66,119
August.....	29,858	33,353	7,065	10,384	18,608	22,830	55,531	63,567
September.....	30,205	32,976	7,186	9,877	21,269	22,514	58,660	65,367
October.....	30,180	31,758	6,747	9,356	23,161	22,762	60,088	63,876
November.....	31,355	31,789	7,002	8,642	23,087	23,557	61,444	63,988
December.....	29,223	29,516	6,196	8,193	24,184	22,918	59,603	60,297
January.....	28,677	28,675	6,378	8,260	22,217	18,594	57,272	55,529
February.....	28,586	27,051	6,651	7,196	22,603	19,800	57,840	54,047
March.....	27,947	26,444	6,137	7,342	25,680	19,923	59,764	53,709
April.....	27,807	27,413	6,527	7,169	23,693	23,067	63,027	57,649
May.....	27,148	27,231	6,535	7,049	34,515	21,225	68,198	55,505
June.....	27,360	29,272	6,554	7,463	40,040	21,559	74,454	53,294
July.....	27,046	30,309	6,350	7,139	40,491	19,273	73,887	56,721
August.....	26,695	29,858	6,200	7,065	43,762	22,830	76,657	55,531
September.....	26,674	30,205	5,994	7,186	45,560	21,269	78,228	58,660
October.....	23,454	30,180	6,017	6,747	45,538	23,161	77,009	60,088
November.....	24,303	31,355	5,860	7,002	40,817	23,087	71,180	61,444
December.....	22,422	29,223	5,178	6,196	38,783	24,184	66,383	59,603
January.....	23,269	28,677	5,563	6,378	34,254	22,217	63,086	57,272
February.....	22,930	28,586	5,049	6,651	35,745	22,603	63,724	57,840

Comparative Statement.

STATISTICAL SUMMARY OF THE PETROLEUM SITUATION.

	1887. February.	1886. February.
Wells completed.....	147	265
New production.....	8,061	3,352
Dry holes.....	24	35
New rigs.....	66	269
Old rigs.....	120	118
Drilling wells.....	172	367
Total field operations.....	358	754
Average daily pipe line runs.....	63,374	55,966
Average daily shipments.....	66,938	71,081
Total stocks custody pipe lines.....	32,064,685	32,847,735

THE MARKET.

Refined in New York.....	6%	7%
Opening price of crude for the month.....	69%	82%
Highest price of crude for the month.....	69%	84%
Lowest price of crude for the month.....	59%	74%
Closing price of crude for the month.....	61%	79%
Average price of crude for the month.....	63%	80%

The Stryker Oil and Gas Company was organized and chartered on the 1st of March with a capital stock of \$25,000; ten per cent. assessment levied and a board of directors elected: Fred Barber, J. A. Miles, J. A. Von Behren, Peter Charpiot, Fred Lanys, J. G. Rumsey, N. B. Stubbs, B. F. Kniffin, J. A. Grimes. J. G. Rumsey was elected president, J. A. Miles vice-president, N. B. Stubbs secretary, and Fred Lanys treasurer. Proposals for making a test well are invited from land holders and of contractors for boring.

The National Transit Company has been granted the right of way to supply Cleveland with natural gas.

The Macksburg Field in February.

The production of the Macksburg field, estimated from the pipe line runs, the shipments of the West Virginia Transportation Company, etc., averaged about 229 barrels a day for 1884. The gross runs of the Macksburg pipe line since January 1, 1885, with the estimated amount of oil shipped from the field through other channels is given below. The averages represent the best obtainable figures on the production of the field:

	Macksburg P. L. Runs.	Outside Shipments. Est	Daily Average Production.
1885.			
January	11,894	1500	432
February	20,625	1500	790
March	27,067	1500	922
April	40,527	1500	1400
May	48,258	1500	1605
June	64,982	1500	2216
July	75,737	1500	2492
August	74,228	1500	2443
September	68,110	1500	2320
October	63,619	7000	2278
November	60,926	7000	2264
December	61,113	7000	2197
Total	617,086	34,500	1785
1886.			
January	54,806	7000	1934
February	49,694	7000	2025
March	58,795	8973	2186
April	64,137	7890	2401
May	58,596	6670	2104
June	65,379	2871	2275
July	58,410	4080	2016
August	57,492	2790	1945
September	48,918	1240	1672
October	46,937	3240	1619
November	41,359	4090	1515
December	49,578	3040	1407
Total	645,101	58,844	1682
1887.			
January	37,134	4560	1343
February	28,514	1200	1061

In the month of February three wells were completed in the Macksburg field, with a new production of about 20 barrels. On the last day of the month there were two wells drilling. During January but one well was finished, and on the last day of the month there were three drilling wells. On February 28th there were 468 producing wells in the Macksburg field, with a total daily yield of 1061 barrels, a decline of 282 barrels a day from the January average. Eighteen of the wells, at the present, are temporarily stopped and it requires constant agitation to keep the balance going.

The Kimbolton Oil and Gas Company, ten miles north of Cambridge, Ohio, completed a well on the S. G. Luck farm, February 26th, which struck the Macksburg sand at 980 feet. There was about forty feet of it in all, and fifteen or twenty feet was quite good, and contains a little oil. A second well is being started one and a half miles ahead of the first.

WEST VIRGINIA NOTES.

The Eureka, West Virginia, field is at present of no importance. On February 28th the Brown & Boss well, No. 2, stopped drilling; the cable was taken off and the tools piled up for removal. It is believed to be over 2000 feet deep. There are now no drilling wells in this section.

At Moundsville, W. Va., Craig & Cappeau are fishing for a bit in the big hole at No. 2. No. 1 is called a ten barrel well.

THE Pennsylvania Natural Gas Company will lay a sixteen inch main from its wells at Hickory, to the South Side, Pittsburgh. It will be twenty-five miles long.

BLUE print maps of the Reibold Oil District furnished from the AGE office for one dollar.

Runs, Shipments and Stocks.**RUNS OR RECEIPTS.**

PIPE LINE.	FEB., 1887.	JAN., 1887.
National Transit Co.	1,251,786.12	1,395,510.24
Tidewater	160,975.27	186,466.74
Octave Oil Co.	1,887.00	2,469.00
Excelsior Pipe Line	31,180.56	34,380.98
Pittsburgh Pipe Line	94,147.27	42,157.62
Southwest Pennsylvania	234,487.95	280,526.27

Total	1,774,464.17	1,941,510.85
Daily average	63,373.72	62,629.38

In the above runs only the oil received by the National Transit Co. directly from the wells, is included.

DELIVERIES OR SHIPMENTS.

PIPE LINE.	FEB., 1887.	JAN., 1887.
National Transit Co.	1,672,946.20	1,988,657.69
Tidewater	152,238.93	168,401.66
Octave Oil Co.	3,430.00	1,755.30
Excelsior Pipe Line	23,277.91	34,535.36
Pittsburgh Pipe Line	95,830.54	40,463.00
Southwest Pennsylvania	81,234.02	298,092.26

Total	2,028,957.60	2,531,904.67
Less oil transferred between lines	154,697.79	320,604.65

Total	1,874,259.81	2,211,300.02
Daily average shipments	66,937.85	71,332.26

In the above shipments only the oil delivered to refiners is included.

Daily excess of shipments over runs, February	3,564.10
Daily excess of shipments over runs, January, 1887	8,702.88
Daily excess of shipments over runs, December	11,270.81
Daily excess of shipments over runs, November	10,818.61
Daily excess of shipments over runs, October	580.75
Daily excess of runs over shipments, September	8,057.13
Daily excess of runs over shipments, August	11,931.56
Daily excess of runs over shipments, July	5,557.20
Daily excess of runs over shipments, June	4,793.41
Daily excess of runs over shipments, May	3,967.06
Daily excess of shipments over runs, April	4,899.20
Daily excess of shipments over runs, March	4,561.80
Daily excess of runs over shipments, February	14,701.52
Daily excess of shipments over runs, January, 1886	7,825.68

NET STOCKS.

PIPE LINE.	FEB. 28, 1887.	JAN. 31, 1887.
National Transit Co.	29,380,040.67	29,702,537.09
Tidewater	1,501,613.00	1,443,538.64
Octave Oil Co.	2,914.00	3,954.00
Excelsior Pipe Line	22,253.63	14,350.38
Pittsburgh Pipe Line	4,059.60	5,728.87
Southwest Pennsylvania	1,153,844.92	1,000,550.99
Total	32,064,685.22	32,170,673.97
Stocks decreased, February		105,988.75
Stocks decreased January, 1887		777,975.85
Stocks decreased December		357,196.56
Stocks decreased November		286,526.86
Stocks decreased October		1,790.72
Stocks increased, September		214,073.99
Stocks increased, August		362,652.56
Stocks increased, July		188,510.62
Stocks increased, June		216,583.97
Stocks increased, May		110,800.44
Stocks decreased April 1886		165,635.61

RECEIPTS. DELIVERIES.

Daily average February	63,374	66,938
Daily average January, 1887	62,629	71,332
Daily average December	67,857	79,127
Daily average November	70,767	81,586
Daily average October	76,019	76,600
Daily average September	77,989	69,932
Daily average August	76,880	64,949
Daily average July	74,880	69,323
Daily average June	75,811	71,017
Daily average May	68,602	64,635
Daily average April 1886	64,228	69,127

NOTE—The above figures are in barrels of 42 gallons each, and include only the pipe lines of the New York and Pennsylvania oil regions.

Correction.

[Mr. A. Leo. Weil has handed in the following in reference to statement in his argument, which see pages 1569-74 of this number of the AGE:]

Publishers Petroleum Age:

The language used in my argument before the Legislative Committee, with reference to the control by the National Transit Company of the Tidewater Pipe Company, I am satisfied is stronger than the facts warrant. The idea I intended to convey was, that owing to a pooling arrangement, which it was stated at Harrisburg had been entered into, there was practically no competition between the two lines. I cheerfully make this correction in justice to the companies and in the interest of truth.

A. LEO. WEIL.

MILLER BROS. & CRIPPEN and G. P. Kepler, Tarbell and others have laid a two inch pipe line from the Grand Valley oil district to Titusville, and commenced running oil March 1st.

FEBRUARY OPERATIONS.

THE ENTIRE REGION—WELLS COMPLETED, WELLS DRILLING, AND RIGS UP AND BUILDING.

WELLS COMPLETED IN FEBRUARY, 1887

Allegany Field.

Twp.	Owner.	Barrels.
Wirt, 47, (Jas Jordan)	McQueen & Thurston No 1	5
" 61, (Deyoe)	National Transit (for gas)	gas
Clarksville, 5, (Lane)	Lane Oil Co. No 6	gas
" 12, (Thurston)	Barton, Ackery & Co, No 32	10
" 20, (Congdon)	Clarksville Oil Co.	4
Sharon (Potter County)	Phalen & Co.	gas
Wells completed		6
Production		19
Dry		3

Bradford Field.

East and West Branches.

Warrant 2264, Jno. McKeown, No 1	4
Dent, P C L & P Co No 75	8
Mack, Manufacturers' Gas Co No 2 (for gas)	dry
Cuttling, Booth & Bovaird No 1	5

Knapp's Creek.

Erskine, Doe & Smith	4
Eldred, Elder Bennett	3
Norton, Mitchell & Jones, No 21	8

Foster Brook.

Lafferty, Van Vleck & Gifford No 58	8
" " " " No 59	10

Indian Creek.

Hamlin, Forest Oil Co No 41	8
Shattuck, Russell & Johnson No 11	8
Dodge, T Jennings No 3	5

Kinzua.

Guffey & Hullings, Union Oil Co No 69	8
Wells completed	13
Production	79
Dry	1

Warren and Forest.

GLADE AND OTHER TOWNS.

Kinzua Village.

White, Morse & Collins No 7	200
Weed, " " No 7	300
Willie Run, Smith, Bright & Co No 6	60
Fuller, P. M. Smith & Co No 4	4
Richardson, T G Phillips	dry
Wells completed	5
Production	564
Dry	1

Clarendon.

35, Nutting & Co No 7	5
35, Henderson & Murphy	5
35, Bell & Hazeltine	6
77, Waterhouse & Co No 8	5
77, Armstrong & Hue, No 2	3
105, R. I Shugert	5
105, Hackett & Shirley No 6	5
531, S Short & Son No 16	5
556, J A Waterhouse & Co No 23	6
556, " " No 24	6
Wells completed	10
Production	51

Tiona.

75, (lot 34) Fertig & McKinney No 9	5
201, Keegan, Sage & Co	5
240, W W Winger No 5	5
244, Horton, Crary & Co No 13	5
Wells completed	4
Production	20
Dry	0

Cooper District.

2991, (lot 4) Forest Oil Co No 5	10
Wells completed	1
Production	10
Dry	0

Balltown.

5268, James Welsh, est	10
Wells completed	1
Production	10

Kane.

343, (Looker) Ernhart & Co No 1	15
343, Rathbone & Mallory No 11	10
343, Treat & Mallory No 6	10
343, " " No 7	10
3767, Assd Producers & Craig & Cappeau No 16	10
3775, Brenneman & Walker	10
Wells completed	6
Production	65
Dry	0

Grand Valley.

Tornado 128 (Nickel) McConnell	dry
Blakeslee, Miller & Crippens No 9	12
Lot 150, Fertig & Lord No 6	6
Spring Creek, (Hummer) Stewart & Co	10
Enterprise, lot 133) Myron Dunham	10
Lot 154, Robinson & Cassell	3
Lot 150, Nelson Farrell No 10	8
Lot 103, (W. Thompson) Porter & Gilmore	dry
Wells completed	8
Production	49
Dry	2

Miscellaneous.

234, Pennsylvania Gas Co No 10	gas
Pineville, (Landers) Dunham & Conrath	4
Wells completed	2
Production	4
Dry	1

Lower Country.

Venango.

Farm.	Operator.	Barrels.
Swab, Oil City Fuel Supply Co.		gas
Mt. Hope, Dr. Galbraith No 2		6
Wallaceville, Phillips Bros.		dry
Loots, (2 acres) W. H. Loots		2
Tract 47, (Egert) J J Fisher No 9		4
Eagle Rock, (McCray) Trubey & Mitchell		dry
Griffin, James Purtil No 2		3
Columbia, Columbia Oil Co No 171		10
Cherry Tree (G W Stevenson) Wilson Bros.		6

Vicinity Pleasantville.

Newton, W P Black No 2	4
McGahey, " "	3
Foss, " "	5

Tipperary.

Heckathorn, Phinney & Bishop No 3	5
M Fox, Sandy Lake Oil Co No 1	3

Tarkill.

Kahle, Kahle Bros No 6	10
Sam Hill, Marks & Shafer No 4	5
Thompson, Hess, Sackett & Co	5
Lloyd, lot 5, Reno Oil Co No 2	6
Benninger, Columbia Gas Co	10

Rockland or Red Valley.

Jolly, Leckey & Foster No 11	10
Hetzler, Morgan & Co No 9	10

Vicinity Emlenton.

Sands, Frank Sands	4
Wellsby, L M Hale & Co	dry

Wells completed	23
Production	111
Dry	4

Clarion.

Kahle, Berlin & Son	10
Mahle, Smith, Younkers & Corlett, No 3	5
Stumpner, Stumpner Oil Co	5
Shippen, Jno J Carter No 7, est	10
McCleary, McCleary Bros & Co No 3	dry
Tylersburg, Cook, Leeler & Co No 4	dry
Amsler, Amsler Bros No 3	3
Shippen, Ash and Oil Co	3
Wells completed	8
Production	36
Dry	2

Butler and Armstrong.

Geo Rogers, W S Guffey & Queen	6
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Brownfield, Richard Jennings	5
Wm Hickey, Fisher Oil Co No 8	10
" " " " No 9	5
O Niel, M P Black & Co No 2	15
J Frederick, Campbell & Co No 2	10
Harmon, Hazelwood Oil Co	dry
Fennel, Greenlee & Co	15
Mars, (Belford) R W Miller	dry
Widow O Niel, McBride, Campbell & Co	40
McJunkin, Quilter & Co	5
Harbison, Connors & Fishel est	15
Eminger, Russell & Co No 2	10
Barnhart, Vensel & Co	30
Frederick, Frederick & Co No 3	30
Eminger, Hill & Hayes est	10
Heid, T W Phillips & D Osborne No 3	200
" " " " No 4	215
" " " " No 5	75
" " " " No 6	50
Markle, " " " " No 2	528
" " " " No 3	360
Blakeley, " " " " No 1	480
" " " " No 2	600
Heid, Leidecker Bros No 4	840
" " " " No 5	720
Blakeley, " " " " No 1	720

St. Joe.

Augert, P C L & P Co	dry
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Thorn Creek.

Bulford, Iman, McBride & Campbell	25
Burton, McBride & Campbell	50
Girard, M Finnegan	4
Klingler, Iman, Waldron & Co	50
Hays, Clark & Co	dry

Wells completed	33
Production	5123
Dry	4

Washington.

Gordon, P L & H Co No 6	175
Barre, Forest Oil Co No 10	25
Taylor, The Union Oil Co No 7	30
Thos McGahey, Mascot Oil Co No 7	15
Martin, John McKeown No 2 est	50
Munce hers, I Willets & Son No 6	100
" " " " No 22	30
Martin, Central Oil Co No 3 est	150
Linn, Manufacturers' Natural Gas Co	dry
Wright, Chartiers Oil Co No 4	140
" " " " No 5	200
W Thome Lee & Shank No 2	250
Whittlesee, Caldwell & Co	100
Watson, Butler & Co	30
Martin, Allen, Dyer & Co No 2	20
Brownsville, Home Natural Gas Co	gas
Monongahela City, Monongahela Gas Co	gas

Taylorstown.

Carson, West Virginia Natural Gas Co	dry
Blaney, Hart Bros & Co est	140
Noble, West Virginia Natural Gas Co	225
Cundell, Reed, Vandergrift & F M Aiken	165

Wells completed	20
Production	1645
Dry	4

Shoustown, Etc.

Stevenson, Raccoon Oil Co No 4	25
Wallace, " " " " No 5 est	40
A P Morrow, Raccoon Oil Co & Solar Oil Co No 19	100
" " " " " " No 20	100
Thompson, P M Shannon No 10	dry
Purdy, P M Shannon No 2 est	10
Mt Nebo, Union Oil Co	dry

Wells completed	7
Production	275
Dry	2

DRILLING WELLS.

RIGS UP AND BUILDING FEBRUARY 28, 1887.

Allegany Field.

Lot.	Owner.	Depth.
3,	Coyle & Simon (old)	rig
12,	Allen & Morse (old)	rig
12,	Griffin & Co No 10 (old)	rig
50,	Pease & Coyle No 9 (old)	rig
46,	(L G Norton) Allentown Oil Co	drilling
New rigs		0
Old rigs		4
Drilling		1
Total		5

Alma.

3, M J McMullan & Co No 5 (old)	rig
23, Vance & Horton (old)	rig

2019, Clark & Foster	drilling
3672, "	rig
2033, Porter, Thyng & Co No 2	drilling
2033, Boggs, Rosenberg & Co No 3	r
4022, Coast & Sons (old)	drilling
Sutton Hill, A F Fr tts (old)	rig
Youngs ville, (John Siggins) Seranton Oil Co (old)	rig
Wilcox, (2426) Markham & Co	cilling
Climax, Ellis & Co	drilling

Forest County.

Hickory twp, Taylor, Torrey & Co.	drilling
Howe twp, Shannon Syndicate	600
Harmony, (Rhodes) Dunham & Co.	sand
Tionesta, Mealey Bros	drilling
Shamburg, Young & Loucks	drilling

New rigs	3
Old rigs	4
Drilling	9

Lower Country.

Venango and Other Sections.

Allegheny Bank lands, Oil City		
Fuel Supply Co.....	rig	
600 Acres, Oil City Fuel Supply Co		
“ “ No 2.....	drilling	
“ “ No 4.....	drilling	
Fox, “ No 1.....	drilling	
Christie & Strauch, “ No 1.....	drilling	
McBride, Thomas Smith (old).....	rig	
Kaufman, A P Dale No 9 (old).....	rig	
Osmer, Galbraith & Parker (old).....	rig	
Mt Hope, Dr Galbraith No 3	rig bldg	
Slab Furnace, S P McCalmont (old)		rig
Main, W J Robinson (old).....		rig
Rynd, Wratten & Co (old).....		rig
Buchanan, J H McCandless	rig bldg	
Columbia, Columbia Oil Co No 172 ..	rig bldg	
Victory twp, Conway Bros	drilling	
Tract 47, J J Fisher No 10.....		rig
Eagle Rock, Daggett & Co (shut down).....		400
Pithole, (Blank) Duke & App'bee ..		rig
Kenan, Kirkwood & Barcroft	drilling	

Vicinity Pleasantville.

Egbert, W P Black	drilling
M Gahey, " No 2 (old)	rig
Sheppa d, J Sheppard	rig
Sam Fleming, Siggins & Son	drilling

Tipperary.

Moore, Bee. s & Co No 3 (shut down)	750
J Fox, " No 2	sand
S ggins, Taylor, Torrey & Murphy	
" " No 8	sand
" " No 9	rig
Saddler, Riddle & Lynch (fishing).	600
Heckathorn, Phinney & B shop No 4	drilling
Moore, Speechley & Co No 2 (old)	rig
Wilhelm, Deitrich & Warfield	sand
Big Meadow, (Blakeley) Caning & Reese	drilling
Shannon, Stubler & Co No 2	drilling

Tarkill.

Houser, I H Webb & Co No 9	600
Houser, A P Dale & Co No 8	300
Huff, Clark & Foster	700
Alex Hill, Fisher & Judd	rig bldg

Rockland or Red Valley.

Weeks, W H H Piper No 12..... drilling
 " " " No 13..... rig

Nickleville.

Watson, Watson Bros.....	300
Heuston, Myers Bros.....	drilling

Vicinity Emlenton.

D Russell, Baum & Co (old)	right
W P Grant, J V Ritts (old)	right
Russell, Thos Griffin	drilling
King, Wm King	drilling
Koh meyer, Daniel Wilbur & Co	right
Johnson, Shell & Knight	drilling
Dr Crawford, Wm Weaver No 7.....	sand
" " " " No 8.....	right

Bullion.

Dougherty, Hovis & Co	right
Hovis, Hovis & Co	50
Crawford, Hoffman & Co (old)	right
Rankin, Forest Oil Co	70

New rigs.....	13
Old rigs and shut down.....	13
Drilling.....	27

Clavion.

Berlin, Berlin & Sons No 15 (old)---	right
John Hen 1, Koch Oil Co No 8 (old)	right
Lloyd, Dr Metzger (old)-----	right
Shredder, McCannom & Co (old)---	right

Wagner & Curl, J V Ritts (old).....	rig
Heasley, Heasley & Co (old).....	rig
Brown, J V Ritts (old).....	rig
Wagner & Curl, Wagner & Hahn.....	drilling
Jones, (Corsica) John Deitrich & Young.....	900
Keifer, Hess, Sackett & Co No 1.....	sand
Whit hill, Harr ngton & Co (old).....	rig
Wager & Curl, Wagner.....	300
Delo, P F Kribbs & Co.....	rig
Hess, Hess & Sackett.....	sand
Pine City, Berlin & Co.....	2 rigs bldg
Bangert, Kerstetter.....	drilling
Smith, Wolf, Kusler & Heeter.....	drilling
Paul Black, Clover Bros.....	sand
Newmanville, Bowman & Co.....	drilling
New rigs.....	3
Old rigs.....	8
Wells drilling.....	9
Total.....	20

Butler and Armstrong.

F Miller, W G Crawford & Co (old).....	rig
Chas Duffey, Hoch & Co (old).....	rig
Coyle, McBride & Campbell & Fish- er Oil Co.....	30
Chas Duffey, M Finnegan No 3.....	800
J Kline, Westman & Co (old).....	rig
Hough on, Forquer Bros No 2 (old).....	rig
McKeever heirs, Dennisn & Fleg- ler (fishing).....	750
Malony, Dan Burns.....	sand
Hiram Rankin, Thos M Marshall.....	drilling
Peter Kenne!, John Heiner & Co.....	rig bldg
Jas Coyle, M P Black & Co.....	rig bldg
Washington twp, Fletcher farm, Armstrong, Campbell & Co.....	rig bldg
Frederick, Brady & S mpson No 2.....	sand
J Coyle, Bott & Story.....	1200
Gumper, Ward & Stoup.....	rig
Phil Doubenspeck, Shenango Gas Co No 1 (for gas).....	1600
“ Sherango Gas Co No 2.....	1050
Armstrong, Phillips & Osborne.....	1000
Faller, Mu al Gas Fuel Co (for gas).....	drilling
McCrea, National Transit Co (for gas).....	drilling

St. Joe.

Kelley, T W Phillips & D Osborne. drilling
Mrs Hasler. Christie & Co.----- 1200

Martinsburg.

Knox, Brown & Stanton.....	drilling
" Hoffman & Shanfelt.....	ri
Martinsburg, Jordan & Co....	drilling

Thorn Creek.

Maharg, Bolard & Smith No 3 fishing	120
Burton, Thayer & Crosby No 5 "	sand
" " " No 6----	rig
Rankin, Farmers' Oil Co-----	600
Burton, Shaffer & Co-----	sand
Dixon, Christie & Co-----	300

New rigs.....	9
Old rigs.....	4
Drilling.....	33

Washington.

I Wilson, Forest Oil Co	(old)-----	right
Johnson,	" (old)-----	right
Barre,	" No 7 fishing	sand
"	" No 12-----	2150
"	" No 13-----	90
Morgan, Union Oil Co	No 7-----	1950
"	" No 8 fishing	2000
"	" No 9-----	85
Workman,	" No 1-----	2000
"	" No 2-----	1920
Wm Davis,	" No 6-----	1950
Taylor, Union Oil Co	No 6-----	1850
" Galligan & Young	No 2-----	sand
College Park, Kiskadee & Co	(old)-----	right
Wade, B B Campbell & Co	No 2-----	600
"	" No 3-----	600
Lizzie McGraw, Massey	Oil Co No 6	2300

W J Munce, John McKeown No 12	(fishing)-----	2337
"	" No 13	1700
"	" No 14 rig bldg	
Martin, John McKeown No 1-----		400
Martin heirs, " No 2-----		800
Smith, Willets, Young & Chartiers	Oil Co, No 2 (shut down).	2130
Smith, Willets, Young & Chartiers	Oil Co No 4---	300
Cameron, " No 3-----		sand
" " No 8-----		sand
" " No 9-----		1900
" " No 10-----		1400
Fergus, Chartiers Oil Co No 2-----		1900
Baker's Station, Dyer & Roberts-----		1575
Munce Heirs, Willets & Son No 18-----		1850
" " No 23 (old)		rig
" " No 24 (old)		rig
" " No 25-----		1350
" " No 26 (old)		rig
" " No 27 fish'g		sand
Cradle Factory lot, Miller-----		600
Montgomery, Montgomery No 1-----		1100
Coal Center, Hornbake (shut down)		1100
Martin, Central Oil Co No 2-----		1950
Watson, Butler & Co No 2-----		1900
Wiles, C O & G Co-----		1500
Rouney, Reed & Co (old)-----		rig
Martin, Allen, Dyer & Co No 3-----		1441
McNary, Craig & Co-----		1550
McKeesport, Stone & Co-----		drilling
McKenna, C O & Gas Co-----		1450
Bellvernon, Schmertz (for gas)		drilling

Taylorstown.

Leech, West Virginia Nat Gas Co...	750
Sheller, Aiken, R B Stone & Co.....	2150
McMannis, R bins & Guffey.....	1500

Buffalo Village.

Ebenezer Davis, Wheeling Nat Gas	
Co (for gas)----	rig
R Hamilton, Wheeling Natural Gas	
Co (for gas)----	rig

New rigs.....	2
Old rigs and shut down.....	8
Drilling.....	38

Shannopin.

Thos Pinkerton, J S McKelvy (old)	rig
Charles Eachel, Raccoon Oil Co No 4	
(old)---	rig
A P Morrow, Raccoon Oil Co & Solar	
Oil Co No 21.	sand
" " No 22.	300
" " No 23.	rig
Stevenson, Raccoon Oil Co No 5.	800
" " No 6.	rig
McCoy, Zeigler & Co	1200
Thompson, Union Oil Co	drilling
Davis & Duff, "	drilling
Good, J M Guffey & Co	1800
Hartman, J M Guffey & Co.	1500
Riddle, Philadelphia a Co (fishing).	1000
McKee, (Oakdale) Forest Oil Co.	1850
J McLaughlin J W Craig & Co.	1000
John McConnell, P M Shannon.	drilling
James Harper, Hopewell Oil Co.	1200
Anderson farm, Nameless Oil Co.	drilling
Reed, Reed, Davidson & Co.	rig
Elizabeth twp, Frederick & Cal-	
houn.	1000
Wm McElheny, "	rig
John Morrow, Raccoon Oil Co No 5.	rig
Crafton Station, Lamb & Co.	800

Greene County, Etc.

Fordyce E M Hukill & Co No 1 (shut down).....	1360
Gregg, E M Hukill & Co No 1 (fishing).....	2275
Garard, E M Hukill & Co No 1 (shut down).....	730
Garard, E M Hukill & Co No 2 (shut down).....	1060
Hathaway, E M Hukill & Co No 1 (shut down).....	1060
Mt. Morris, E M Hukill & Co No 1. sand	
Longanecker, " (old)..... rig	
Ninevah, Johnston & Hamilton..... drilling	
Board Tree, Wheeling Natural Gas Co.....	1800
McGinnis farm, Wheeling Natural Gas Co (shut down).....	1100
Sugar Grove, Wheeling Natural Gas Co (shut down).....	1200
Moundsville, Riggs, J W Craig & Co drilling	
" Rogers, J W Craig & Co (fishing).....	2050
Sycamore Station, Greene Co, I Willets & Co (old)..... rig	
Wade P O, Ohio, Craig, Cappeau & Co..... drilling	
Bethany, Bateman Goe & Co.....	1200
Bristoria, Forest Oil Co (fishing).....	1100

New rigs	5
Old rigs and shut down	2
Drilling	20

Total	27
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Stocks Abroad.

Reports of stocks in London, and the seven principal Continental ports, are summarized in the following statement:

	Feb. 19, 1887.	Jan. 15, 1887.
STOCKS AFLOAT AND ASHORE.	Barrels.	Barrels.
Seven Continental Ports.....	597,119	740,402
London.....	177,721	180,048
Total Stocks afloat and ashore.....	774,840	920,450
Decrease in stocks since Jan. 15.....	145,610	

A detailed statistical table giving the stocks on hand, the stocks in vessels on the ocean, and the amount unloading from the vessels at the different ports, is appended, which shows at a glance the condition of affairs abroad and the increase or decrease as compared with the corresponding period of 1886. The shipments represent the amount of oil going to the interior of Europe from the seaports:

STOCKS IN FOREIGN PORTS FEBRUARY 19, 1887.

PORTS.	Stocks week ending Feb. 19.		Stocks afloat week ending Feb. 19.		Loading. Week ending Feb. 19.		Grand total stocks afloat and loading.		Receipts From July 1.		Shipments from July 1.	
	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.
London.....	105,608	73,051	54,506	74,670	7,500	30,000	167,608	177,721	484,328	418,664	486,707	531,505
Bremen.....	157,059	100,127	27,775	70,841	29,500	12,000	214,334	182,968	379,096	482,959	670,107	594,208
Hamburg.....	29,547	46,682	65,313	73,301	48,500	19,000	143,360	138,983	631,721	614,317	783,016	752,500
Antwerp.....	40,526	50,379	81,283	72,905	29,000	9,500	150,809	132,784	637,126	593,503	708,017	703,825
Rotterdam.....	28,885	15,153	26,189	13,770	16,000	22,500	71,074	51,423	297,072	376,374	337,125	443,160
Amsterdam.....	23,172	15,048	24,991	15,726	10,500	16,000	64,663	46,774	184,855	171,423	183,054	223,853
Stettin.....	15,731	13,453	15,677	5,054	4,200	31,408	22,707	220,685	28,135	263,166	60,762	282,475
Danzig.....	9,797	21,180					9,797	21,480	58,858	54,945		62,702
Total.....	310,717	262,322	241,228	251,597	133,500	83,200	685,445	597,119	2,409,414	2,603,656	3,005,247	3,062,723
Total stocks Continental Ports.....									1884.	1885.	1886.	1887.
Total afloat, ".....									1,069,464	696,371	310,717	262,322
Total loading, ".....									190,883	139,649	241,228	251,597
Total.....									141,300	78,800	133,500	83,200
Afloat and loading for direct Continental Ports.....									1,401,647	914,811	685,445	597,119
" " " Baltic Sea, exclusive Stettin and Danzig.....									95,300	19,500	25,000	14,500
" " " Total Continental Ports.....									2,500	7,500	5,000	3,400
" " " Total London.....									1,439,447	941,811	715,945	615,019
" " " English harbors, exclusive London.....									360,585	103,156	167,608	177,721
Grand total.....									49,000	60,200	72,200	97,500
									1,909,032	1,105,167	955,753	890,240

OFFICIAL STATEMENT—EXPORTS OF PETROLEUM, JANUARY, 1887.

BY WM. F. SWITZLER, CHIEF OF BUREAU OF STATISTICS, WASHINGTON, D. C., FEBRUARY 9, 1887.

CUSTOMS DISTRICTS.	MINER'L CRUDE.		NAPHTHAS.		ILLUMINATING.		LUBRICATING & PARAFFINE OILS.		RESIDUUM.		TOTAL.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Boston and Charles-town, Mass.....					554,875	55,476	3,414	753			558,289	56,229
New York, N. Y.....	5,276,263	345,833	975,730	88,932	27,566,535	2,209,096	1,264,355	216,040	120,066	5,600	35,203,549	2,865,501
Philadelphia, Pa.....	2,820,922	173,924			7,809,484	544,847	16,852	2,540			10,647,258	761,311
Baltimore, Md.....					1,126,455	76,196					1,126,455	76,196
Total for Jan., 1887.....	8,097,185	519,757	975,730	88,932	37,057,349	2,925,615	1,284,621	219,333	120,066	5,600	47,535,551	3,759,237
Total for Jan., 1886.....	4,547,179	337,682	466,091	40,393	35,807,738	3,111,177	951,068	181,067	245,868	16,770	42,017,944	3,687,089
Total for 7 months ending Jan. 31, 1887.....	52,226,920	3,333,066	11,742,474	1,030,032	282,909,875	21,994,765	8,777,820	1,663,019	986,278	49,998	356,643,367	28,075,880
Total for 7 months ending Jan. 31, 1886.....	52,373,010	3,931,909	9,032,137	702,218	272,306,769	24,271,365	6,882,611	1,420,090	2,341,122	140,094	342,935,649	30,465,676

CRUDE QUOTATIONS FOR FEBRUARY, 1887.

Day of Month and week.	BRADFORD.				OIL CITY.				NEW YORK.				PITTSBURGH.			
	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed
T 1.....	69½	69½	67½	68½	69½	69½	67½	68½	69	69½	67½	68½	69½	69½	67½	68½
W 2.....	67½	68½	66½	67½	67½	68½	66½	67½	68	68½	66½	67½	67½	68½	67	67½
T 3.....	67½	67½	66½	67½	67½	67½	67	67½	67½	67½	66½	67½	67½	67½	67	67½
F 4.....	67½	67½	66½	66½	67	67½	66½	66½	66½	67½	66½	66½	67½	67½	66½	66½
S 5.....	66½	66½	62½	63½	66½	66½	62½	63½	66½	66½	62½	63½	66½	66½	62½	63½
M 7.....	63½	64	62½	63½	63½	64	62½	63½	63½	64	62½	63½	63½	64	62½	63½
T 8.....	63½	63½	61	61½	63½	63½	61	61½	63	63½	61½	61½	63½	63½	61½	62½
W 9.....	62	63½	62	63½	62½	63½	62½	63½	62	63½	61½	61½	62½	63½	62½	63½
T 10.....	64	64½	63	63½	64	64½	63	64	63½	64½	63	63½	63½	64	63	64
F 11.....	63½	64	63½	63½	63½	63½	63½	63½	64	64½	63½	63½	63½	63½	63½	63½
S 12.....	63½	63½	61½	63½	63½	63½	63½	63½	63½	63½	63½	63½	63½	63½	63½	63½
M 14.....	63½	63½	62½	62½	63½	63½	62½	62½	63½	63½	62½	62½	63½	63½	62½	62½
T 15.....	62½	62½	60½	60½	62½	62½	60½	60½	62½	62½	60½	60½	62½	62½	60½	60½
W 16.....	59½	61½	59½	61½	60	61½	59½	61½	60½	60½	60	61½	60½	61½	59½	61½
T 17.....	61½	61½	60½	61½	61½	61½	60½	61½	61½	61½	60½	61½	61½	61½	60½	61½
F 18.....	61	61½	60½	60½	60½	61½	60½	60½	61½	61½	60½	60½	60½	61½	60½	60½
S 19.....	60½	61½	60½	61½	60½	62	60½	61½	60½	62	60½	61½	60½	62	59½	61½
M 21.....	61½	62½	61½	62½	61½	63	61½	62½	61½	63½	61½	63½	61½	63½	61½	62½
T 22 Holiday.																
W 23.....	63	65½	63½	65½	63	66	62½	62½	63½	65½	62½	65½	63	66	62½	65½
T 24.....	64½	65½	61	61½	64½	65½	61½	61½	64½	65½	61	61½	64½	65½	61½	61½
F 25.....	61½	62½	61½	62	61½	62½	61½	61½	61½	62½	61½	61½	61½	62½	61½	62
S 26.....	61½	62½	61½	61½	61½	62½	61½	61½	61½	62½	61½	61½	61½	62½	61½	61½
M 28.....	61½	61½	61½	61½	61½	62	61½	61½	61½	62	61	61½	61½	62	61½	61½

Bradford National Bank

—OF—

BRADFORD, PENN'A.

Capital, \$200,000. Surplus, \$40,000.

O. F. SCHONBLOM, Pres't. P. T. KENNEDY, Vice-Pres't.
T. H. TOMLINSON, Cashier. C. A. MITCHELL, Asst. Cashier

DIRECTORS:

P. T. Kennedy, W. C. Kennedy, R. J. Straight
O. F. Schonblom, H. F. Whiting.

TRANSACTION A GENERAL BANKING BUSINESS.

Make collections; sell drafts on Europe; buy and sell United States bonds.

Prompt attention given to all business entrusted to us at the Lowest Rate of Charges.

First National Bank

—OF—

BRADFORD, PA.

Capital, \$150,000. Surplus, \$30,000.

S. G. BAYNE, Pres't, J. M. FULLER, Vice-Pres't.
W. W. BELL, Cashier.

DIRECTORS:

T. W. BROWN, Vice-President Provident Life Trust Co.,
Philadelphia; C. M. FARRAR, of Farrar & Trefts,
Buffalo; L. F. LAWTON, Cashier First National Bank,
Olean, N. Y.; A. B. WALKER; F. W. DAVIS; C.
C. MELVIN; J. M. FULLER; S. G. BAYNE, W.
W. BELL.

STOCKHOLDERS.

Daniel O'Day, Joseph Seep, W. A. Pullman, Byron D.
Hamlin, Henry Hamlin, A. G. Olmsted, L. Emery Jr., J. T.
Jones, C. E. Hequembourg, L. E. Hamsher, Jno. McKeown,
Robert C. Simpson, W. R. Weaver, F. D. Wood, Asher
Brown, John Ley, P. L. Webster, Jos. Stettheimer, H. A.
Marlin, Robert Long, I. W. Shirley, A. Hochstetter, Sheldon
Jewett, P. W. Roth, James E. Blair, A. B. Smith, Kenton
Saulnier, E. T. Howes, George H. Mills.Transact general banking business. Make collections, sell
drafts on Europe, and give prompt attention to all business
entrusted to us at lowest rates.

JOHN CONLEY,

MANUFACTURER OF

IRON, GAS AND STORAGE TANKS,

—AND—

GASOMETERS.

REPAIRING PROMPTLY ATTENDED TO

SHOP, NO. 17 GORTON STREET,
BRADFORD, PA.

FOR OIL OR GAS WELL PACKERS

SEND YOUR ORDERS TO

S. R. DRESSER, BRADFORD, PA.,

Who will fill them promptly with

The Best Malleable Iron Frame and Superior Quality of Rubber.

He Makes a Specialty of the Packer Business and Can Give You
Anything in that Line.

THE LIGHT RUNNING

SIMPLE STRONG

NEW HOME

SWIFT SURE

SEWING MACHINE

HAS NO EQUAL.

PERFECT SATISFACTION

New Home Sewing Machine Co.

—ORANGE, MASS.—

30 Union Square, N. Y. Chicago, Ill. St. Louis, Mo.
Atlanta, Ga. Dallas, Tex. San Francisco, Cal.

FOR SALE BY

C. H. DUBOIS, BRADFORD, PA.

J. W. McFARLAND,

BROKER IN OIL PRODUCTION.

81 MAIN STREET.

Buys, Sells and Leases all kinds of Oil Properties. In-
formation carefully given.

ADDRESS LOCK BOX 1925, BRADFORD, PA.

JAMES C. BOYCE,

ATTORNEY AT LAW,

Solicitor of Patents and Attorney in Patent Causes.

ROOM NO. 3,

Over Oil Well Supply Company, Limited.

Corner Main and Webster streets, - - BRADFORD PA.

H. A. MARLIN & CO.,

PETROLEUM BROKERS

BRADFORD AND NEW YORK.

ASBESTOS PACKED STRAIGHTAWAY COCKS.

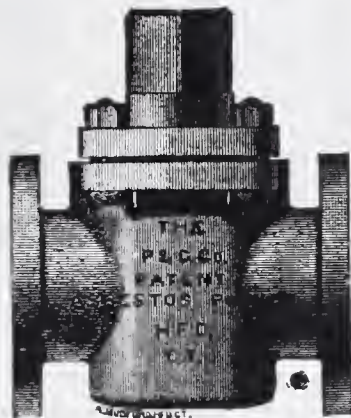
FOR OIL, STEAM, GAS, AIR, AMMONIA, ETC.,

As the goods come in contact ONLY with VULCANIZED ASBESTOS, it never cuts, grinds or sticks, as is the case with ordinary cocks. This cock always opens and closes easily and remains absolutely TIGHT, where all other valves or cocks will leak.

They are recommended for Steam, Gas, Ammonia in all its forms, Chemicals, Boiler Blow-off, or where a vacuum is required, and all difficult places.

The regular cocks are guaranteed to stand a steam pressure of 300 lbs. per square inch, but special goods are made and guaranteed to stand 2,000 lbs. per square inch.

We also make cocks to stand 1,000 degrees of superheated steam, Gland End Cocks for Ice Machines and all other difficult places. Either Screw or Flange ends as required.



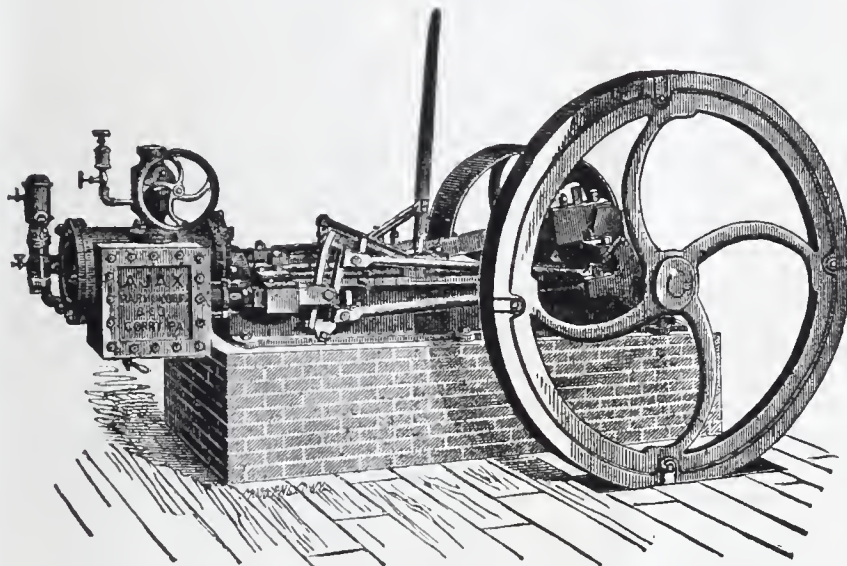
All Goods Warranted to Give Satisfaction.

SEND FOR DESCRIPTIVE CIRCULAR AND PRICE-LIST.

Fairbanks & Co.,

311 Broadway, New York,
216 Main Street, Buffalo, N. Y.
302 Wood St., Pittsburg, Pa.,
17 Light St., Baltimore, Md.,
715 Chestnut St., Philadelphia, Pa.
382 Broadway, Albany, N. Y.
Fairbanks, Brown & Co., 83 Milk St., Boston.
And the trade generally.

THE AJAX ENGINE,



Manufactured by Harmon, Gibbs & Co.,

Is still the favorite in every field from the 400 feet wells of Grand Valley to the 3,000 feet wells of Washington. Economy in Fuel, Strength, Power, Speed and Durability are its strong points. Nearly 2,000 now in use, and you may travel from Wellsville, N. Y., to Macksburg, O., and not find one in a junk or repair shop.

We finish them in the shop and do not have to follow them into the field to make them run. Record of "Ajax" No. 1105 over 22,000 feet and still drilling.

JAMES M. LAMBING, General Agent, Corry, Pa.

OFFICE OPPOSITE PASSENGER DEPOT.

SIGNIFICANT.

"As good as the **DOMESTIC**," or "like the **DOMESTIC**," is what Competitors say when speaking of the merits of their machines, and all improvements made by the **DOMESTIC** are imitated as soon and closely as possible.

Why? Did you ever think what this means? Does it not imply in the strongest manner possible the pre-eminent excellence of the

—+— **"DOMESTIC" SEWING MACHINE,** —+—

That it is the only recognized Standard and Leader in Progress?

J. W. FRITTS, Agent.

No. 7 Kennedy St., Bradford, Pa.

W. & W. R. R. TIME TABLE.

DECEMBER 27, 1886.

NORTHWARD		STATIONS.	SOUTHWARD	
No. 3	No. 1		No. 2	No. 4
P. M.	A. M.		A. M.	P. M.
2 00	6 00	Lv. Waynesburg	10 35	6 25
2 15	6 15	Sycamore	10 17	6 07
2 23	6 23	Swart	10 09	5 59
2 30	6 30	Deer Lick	10 02	5 52
2 38	6 38	West Union	9 53	5 43
2 47	6 47	Dunn	9 43	5 33
2 50	6 50	Linley's Mill's	9 40	5 30
3 01	7 02	West Amity	9 28	5 18
3 06	7 08	Luellen	9 22	5 12
3 11	7 13	Baker	9 17	5 07
3 14	7 20	McCacken	9 13	5 00
3 27	7 35	Vankirk	9 00	4 47
3 40	7 50	Braddock	8 48	4 33
3 55	8 05	Ar. Washington	8 35	4 20
6 36	9 55	Ar. Pittsburg	6 10	1 55

Time given above is Central Standard, which is 40 minutes slower than Pittsburg or local time, or one hour slower than Eastern time.

The Company reserve the right to vary from this schedule as circumstances may require. All trains daily except Sunday.

C. E. BOWER, Superintendent.

Chicago & Atlantic R. R. Co.

TIME TABLE IN EFFECT SUNDAY, JAN. 9, 1887.

WESTWARD.				
STATIONS.	No. 3. P. C. Ex.	No. 5. Ch. L. Ex.	No. 1. Ch. L. Ex.	
Marion	Lv. 10 15 p.m.	3 08 p.m.	8 25 a.m.	
Kenton	11 05 p.m.	3 52 p.m.	9 18 a.m.	
Preston			9 46 a.m.	
Lima	11 48 p.m.	4 36 p.m.	10 15 a.m.	
Spencerville			10 43 a.m.	
Decatur	1 00 a.m.	5 47 p.m.	11 46 a.m.	
Huntington	Ar. 1 55 a.m.	6 35 p.m.	12 50 p.m.	
Huntington	Lv. 2 05 a.m.	6 46 p.m.	1 05 p.m.	
Akron			2 14 p.m.	
Rochester	3 24 a.m.	7 50 p.m.	2 35 p.m.	
North Judson	4 18 a.m.		3 40 p.m.	
Crown Point	5 20 a.m.		4 4 p.m.	
Hammond	5 55 a.m.	1 05 p.m.	5 30 p.m.	
Chicago	Ar. 7 00 a.m.	11 05 p.m.	6 35 p.m.	

EASTWARD.				
STATIONS.	No. 12. Atl. Ex.	No. 8. N. Y. Ex.	No. 10. Mail Ex.	
Chicago	Lv. 7 45 p.m.	3 55 p.m.	8 35 a.m.	
Hammond	8 45 p.m.	4 55 p.m.	9 35 a.m.	
Crown Point	9 10 p.m.	5 25 p.m.	10 14 a.m.	
North Judson	10 20 p.m.	6 37 p.m.	11 25 a.m.	
Rochester	11 17 p.m.	8 10 p.m.	12 35 a.m.	
Akron	11 34 p.m.	8 37 p.m.	1 00 p.m.	
Huntington	Ar. 12 45 a.m.	9 45 p.m.	2 15 p.m.	
Huntington	Lv. 12 50 a.m.		2 30 p.m.	
Decatur	1 46 a.m.		3 30 p.m.	
Spencerville	2 44 a.m.		4 45 p.m.	
Lima	3 08 a.m.		5 11 p.m.	
Preston			5 40 p.m.	
Kenton	4 00 a.m.		6 08 p.m.	
Marion	Ar. 4 45 a.m.		7 00 p.m.	

Trains run on Central Standard time.
Trains 3, 5, 12, 32 and 39 run daily, all others daily except Sunday.
Train 12 has Pullman Buffet Sleeping Car to Boston and New York daily.
Train 3 has Pullman Buffet Sleeping Coaches from Boston and New York daily.
Train 5 has Pullman Buffet Sleeping Coaches from New York to Chicago.
All through passenger trains arrive at and depart from the new Dearborn Station, Chicago.
Passengers going East or West will find it to their advantage and interest to consult the agents of this company, who will give them all information in regard to rates and connections.

F. BROUGHTON, General Manager, Chicago. F. C. DONALD, General Passenger Agent.

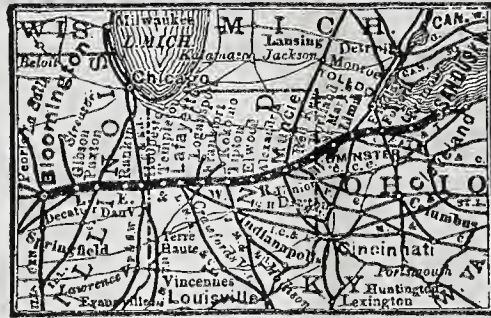
JOHN F. STRATTON, 49 Maiden Lane, New York.



Importer, Manufacturer and Wholesale Dealer in all kinds of Musical Merchandise, Musical Boxes, Band Instruments. Stratton's Celebrated Russian Gut Violin Strings.



LAKE ERIE & WESTERN R.Y.



THE SHORT LINE BETWEEN THE EAST & WEST.

The shortest and most direct route, making immediate connections for passengers east and west.

CONDENSED TIME OF THROUGH TRAINS.

SEPTEMBER 20, 1886.

WESTWARD.		CENTRAL TIME.		EASTWARD	
10 15 p.m.	9 50 a.m.	Ar. Sioux City	Lv. 4 50 p.m.	7 50 a.m.	
7 40 a.m.	7 45 " "	" Dubuque	6 30 a.m.	9 50 p.m.	
2 18 " "	9 15 a.m.	Lv. Bloomington	3 17 p.m.	8 20 a.m.	
I. B. & W. R'y					
9 20 a.m.	7 15 p.m.	Ar. Council Bluffs	Lv. 6 00 p.m.	9 10 a.m.	
8 40 p.m.	6 20 a.m.	Burlington	2 35 p.m.	10 30 p.m.	
5 10 " "	7 45 a.m.	Peoria	7 10 p.m.	6 45 a.m.	
2 55 " "	5 20 a.m.	Lv. Bloomington	9 25 p.m.	9 10 a.m.	
C. & A. R'y					
7 10 p.m.	7 00 a.m.	Ar. Omaha	Lv. 9 05 p.m.	7 50 a.m.	
12 25 p.m.	1 00 p.m.	St. Joseph	2 45 p.m.	3 00 p.m.	
11 55 a.m.	11 55 p.m.	Atchison	3 15 a.m.	3 20 p.m.	
8 50 " "	9 15 " "	Kansas City	6 00 a.m.	6 45 p.m.	
5 50 p.m.	6 30 a.m.	Lv. Bloomington	9 00 p.m.	8 55 a.m.	
C. & A. R'y					
7 45 p.m.	7 45 a.m.	Ar. St. Louis	Lv. 7 55 p.m.	7 50 a.m.	
1 45 " "	2 10 a.m.	Lv. Bloomington	2 10 a.m.	1 45 p.m.	
L. E. & W. R'y					
1 25 p.m.	1 35 a.m.	Ar. C. & A. Junc.	Lv. 2 20 a.m.	9 20 a.m.	
1 15 " "	1 25 a.m.	Bloomington	2 30 " "	9 30 a.m.	
11 40 a.m.	11 58 p.m.	Gibson	4 02 " "	10 51 a.m.	
11 02 " "	11 18 " "	Faxton	4 38 " "	11 24 a.m.	
10 10 " "	10 20 " "	Hoopeston	5 34 " "	12 30 p.m.	
9 10 " "	9 20 " "	Templeton	6 38 " "	1 24 " "	
8 25 " "	8 25 " "	La Fayette	7 45 " "	2 20 " "	
8 04 " "	8 04 " "	La Fayette Junc.	7 52 " "	2 25 " "	
7 04 " "	7 12 " "	Frankfort	8 53 " "	3 16 " "	
6 08 " "	6 02 " "	Tipton	9 55 " "	4 10 " "	
5 36 " "	5 38 " "	Elwood	10 21 " "	4 32 " "	
5 15 " "	5 17 " "	Alexandria	10 42 " "	4 51 " "	
4 35 " "	4 35 " "	Monie	11 35 " "	5 45 " "	
3 46 " "	3 42 " "	Red Key	12 15 p.m.	6 25 " "	
3 18 " "	3 13 " "	Portland	12 42 " "	6 20 " "	
2 14 " "	2 07 " "	Celina	1 44 " "	7 52 " "	
1 50 " "	1 42 " "	St. Mary	2 07 " "	8 13 " "	
12 45 " "	12 45 " "	Lv. Ar.	3 05 " "	9 15 " "	
12 35 " "	12 25 " "	Ar. Lima	3 15 " "	9 25 " "	
12 00 p.m.	11 49 a.m.	Lv. Bluffton	3 48 " "	10 02 " "	
11 21 " "	11 12 a.m.	Findlay	4 25 " "	10 38 " "	
11 00 " "	10 52 a.m.	Arcaha	4 46 " "	11 00 " "	
10 43 " "	10 37 a.m.	Fostoria	5 00 " "	11 15 " "	
10 10 " "	10 07 a.m.	Burgon	5 32 " "	11 44 " "	
9 45 " "	9 45 a.m.	Fremont	6 05 " "	12 10 a.m.	
8 40 p.m.	8 45 a.m.	Sandusky	7 00 " "	1 00 " "	
P. F. W. & C. R'y					
11 10 p.m.	9 50 a.m.	Ar. Lima	Lv. 4 10 p.m.	4 40 p.m.	
7 05 p.m.	10 10 a.m.	Lv. Crestline	Ar. 1 15 p.m.	7 55 p.m.	
12 40 " "	11 15 p.m.	Pittsburgh	5 30 a.m.	3 35 a.m.	
3 10 a.m.	3 40 p.m.	Harrisburg	1 55 p.m.	3 20 p.m.	
11 30 p.m.	10 55 a.m.	Baltimore	5 40 p.m.	6 50 p.m.	
11 20 " "	11 50 a.m.	Philadelphia	4 45 p.m.	9 35 p.m.	
8 00 p.m.	9 00 a.m.	New York	6 55 p.m.	6 50 p.m.	
L. S. & M. S. R'y					
	8 40 a.m.	Ar. Sandusky	Lv. 6 05 a.m.		
9 42 p.m.		Fremont	6 32 p.m.		
6 40 " "	6 30 a.m.	Lv. Cleveland	Ar. 9 40 p.m.	8 25 a.m.	
11 55 a.m.	11 55 p.m.	Buffalo	3 30 a.m.	2 47 p.m.	
2 15 " "	3 00 p.m.	Albany	2 20 p.m.	2 00 a.m.	
9 15 p.m.	10 30 a.m.	New York	7 00 p.m.	7 00 a.m.	
7 00 " "	8 30 a.m.	Lv. Boston	Ar. 9 45 p.m.	6 35 a.m.	

Through tickets on sale to all important points. For information in regard to tickets, rates, &c. inquire of Ticket Agents at principal ticket offices, or address,

G. W. SMITH, Gen'l Pass. Agent, BLOOMINGTON, ILL.

MAPS OF THE VARIOUS OIL FIELDS

FOR SALE BY

McMULLEN, SNELL & ARMOR, Bradford, Pa.

THE PETROLEUM AGE.

Buffalo, New York & Philadelphia R. R. THE NEW SHORT LINE TO SUNBURY, WILLIAMSPORT, HARRISBURG PHILADELPHIA, BALTIMORE, WASHINGTON, AND ALL POINTS SOUTH.

Leave Buffalo at 8:00 a. m. (except Sunday) arriving at Olean at 11:00 a. m. Connects at Olean for Bradford. Arriving at 12:45. Train leaves Buffalo at 3:00 p. m. (except Sunday) arriving at Olean at 6:00 p. m., connecting at Olean for Bradford; at Port Allegany for Coudersport; at Emporium with P. & E. R. R. for Harrisburg, Philadelphia, Baltimore, Washington and the South. Train leaves Buffalo at 5:20 p. m. (daily) arrives at Olean at 8:20 p. m.

Train for Buffalo leaves Olean at 5:45 (daily) and 10:45 a. m. (except Sunday) arriving at Buffalo at 8:40 a. m. and 1:25 p. m. Afternoon train leaves Olean at 4:00 (except Sunday) arrives at Buffalo at 7:00 p. m.

GEO. S. GATCHELL,
Gen'l. Superintendent.

J. A. FELLOWS,
Gen'l. Pass. and Ticket Agent.

NARROW GAUGE DIVISION, BRADFORD & OLEAN.

EASTWARD.				Dec 12, 1886.				WESTWARD.			
Sun.	Exp.	Mail.	Exp.	Eastern Time.				Exp.	Mail.	Exp.	Sun.
A. M.	P. M.	P. M.	A. M.					A. M.	A. M.	P. M.	P. M.
7 37	8 30			Ar. Richburg	Lv.	9 00	2 32				
7 30				" Bolivar	"	5 45	9 10	2 40			
11 00	6 00	3 55	8 58	" Olean	"	7 20	11 00	6 05	3 30		
9 15	4 15	2 15	7 15	Lv. Bradford	Ar.	9 00	12 45	7 50	5 18		
A. M.	P. M.	P. M.	A. M.					A. M.	P. M.	P. M.	P. M.

BETWEEN ELDRED AND BRADFORD.

Exp.	Exp.	Exp.	Eastern Time.				Exp.	Exp.	Exp.
P. M.	P. M.	A. M.					A. M.	A. M.	P. M.
5 10	2 55	8 30	Ar.	Eldred	Lv.	7 10	11 37	3 25	
4 50	2 29	8 12	"	Duke Centre	"	7 28	11 53	3 51	
3 55	1 16	7 15	"	Tarport	"	8 25	12 50	5 09	
3 50	1 10	7 10	Lv.	Bradford	Ar.	8 30	12 55	5 15	
P. M.	P. M.	A. M.					A. M.	P. M.	P. M.

30 Miles Saved by the New BRADFORD SHORT LINE.

Between Olean, Bradford, Warren and the Lower Oil Fields. Two fast Express Trains each way, daily except Sunday.

CONDENSED SCHEDULE OF THROUGH TRAINS.

EASTWARD.				Dec 12, 1886.				WESTWARD.			
Exp.	Acc.	Exp.	Eastern Time.				Acc.	Exp.	Exp.		
P. M.	P. M.	A. M.					A. M.	A. M.	P. M.	P. M.	
8 00	3 25	11 25	Ar.	Bradford	Lv.	7 00	9 15	4 20			
6 20	12 45	9 40	Lv.	Kinzua	Ar.	9 15	11 00	6 00			
P. M.	P. M.	A. M.					A. M.	A. M.	P. M.	P. M.	
5 30		9 05	Lv.	Warren	Ar.	11 50	6 49				
5 15		8 50	"	Irvinton	"	12 05	7 05				
4 25		8 10	"	Tidioute	"	12 43	7 40				
3 05		6 50	"	Oil City	"	2 05	9 05				
9 00		8 50	Lv.	Pittsburgh	Ar.	7 25	7 35				
A. M.		P. M.					P. M.	A. M.	A. M.		

J. A. FELLOWS, Gen. Pass. and Ticket Agent,
Buffalo, N. Y.

Buffalo, Rochester & Pittsburgh R. R. BUFFALO AND ROCHESTER DIVISION.

Dec. 19, 1886—Eastern Time.

				STATIONS.							
P. M.	A. M.	P. M.	A. M.					A. M.	P. M.	A. M.	P. M.
7 30	6 15	11 00	Ar.	Buffalo	Lv.	8 40	5 00				
3 18			"	Rochester	"		7 50				
2 40	2 40	8 00	"	Salamanca	"		11 53				
5 00	P. M.		Lv.	Bradford	Ar.	12 30	8 00	12 30			
	2 15		Ar.	do	Lv.	12 55	P. M.	P. M.			
	11 40		"	Ridgway	"	3 26					
		9 56	"	Falls Creek	"	4 55					
		9 50	"	Dubois	"	5 02					
		8 40	"	Punxsutawney	"	6 08					
	A. M.		Lv.	Ar.							

Thousand Mile Tickets sold at Two Cents per mile.

Connections made at Salamanca with the N. Y., P. & O. R. R. for all points West and Southwest; also with the Erie R. R. for all Eastern points; at Bradford with the Narrow Gauge system to all points in the Oil Regions.

JAS. T. GARDNER, Supt.

I. S. EMERY, Gen. Pass. Agt.

Warren and Farnsworth Valley Railroad.

Narrow Gauge Railroad to Garfield, Vandergrift and Dunham's Mills.
Clarendon, Lv. 10 35 5 10 Garfield, Lv. 7 20 3 15
Garfield, Ar. 11 35 6 10 Clarendon, Ar. 8 20 4 15

Trains are run on P. & E. R. R. time. Passengers can leave Oil City and Titusville for Garfield by morning train, remain three and one-half hours in Garfield and return same evening.

A. D. WOOD, General Manager.

THE ERIE NARROW GAUGE SYSTEM.

BRADFORD, BORDELL & KINZUA

AND

Bradford, Eldred & Cuba Railroad.

November 25, 1886.

WESTWARD.			STATIONS.		EASTWARD.			
Exp.	Exp.	Mail.				Exp.	Mail.	Exp.
A. M.	P. M.	A. M.				A. M.	P. M.	A. M.
9 25	5 15	11 15	Ar	Bradford	Lv	7 40	3 10	7 00
8 50	4 40	10 40	"	Kinzua Junction	"	8 20	3 50	7 49
8 43			"	Aiken	"			7 47
8 29			"	Simpson	"			8 01
7 40			Lv	Smethport	Ar			8 45
	4 32	10 30	"	Rew City	"	8 28	3 56	
	4 12	10 05	"	Rixford	"	8 46	4 12	
	4 07	10 00	"	Duke Centre	"	8 51	4 17	
	3 48	9 40	"	Eldred	"	9 10	4 35	
	3 32	9 25	"	Bullis Mill's	"	9 25	4 50	
	3 17	9 09	"	Ceres	"	9 41	5 06	
	3 04	8 55	"	Little Genesee	"	9 55	5 20	
	2 55	8 45	"	Bolivar	"	10 08	5 30	
	2 34	8 21	"	Allentown	"	10 29	5 54	
	2 05	7 50	"	Wellsville	"	11 00	6 25	
			"	Kane	"			
A. M.	P. M.	A. M.				A. M.	P. M.	A. M.

Trains for Kane leave Bradford at 7.00 and 10.00 a. m. and 5.00, arriving at Kane at 9.30 a. m. and at 12.30 and 7.40 p. m. Trains leave Kane at 6.50 and 9.55 a. m., arriving at Bradford at 9.25 a. m. and 5.00 p. m.; arriving at Bradford at 2.45 p. m. and 5.10 p. m. arriving at Bradford at 7.55.

Additional trains leave Bradford for Smethport at 10.00 a. m. and 5.10 p. m. Returning, leave Smethport at 1.00 and 5.50 p. m.

JOHN C. MCKENNA, Superintendent.

WHEELING AND LAKE ERIE

And Cleveland and Marietta R. R.'s.

Time Table—In effect Nov. 1, 1886.

Central Standard Time.

EASTWARD.		No. 5.	No. 7.	No. 9*	No. 1*
Toledo	Lv.	7 45a. m.	12 30p. m.	4 45p. m.	
Oak Harbor	Ar.	8 43	1 22	5 38	
Fremont		9 07	1 47	6 02	
Clyde		9 23	2 03	6 18	
Bellevue		9 38	2 18	6 32	
Monroeville	Lv.	9 57	2 32	7 01	1 35a. m.
Norwalk		10 13	2 50	7 20	1 50
Wellington		11 03	3 45	9 00	2 32
Creston	Ar.	11 52	4 33	10 45	3 15
Orrville	Ar.	12 20p. m.	5 05	11 45p. m.	3 45*
Orrville	Lv.	12 40	5 05	6 00a. m.	6 00
Massillon	Ar.	1 20	5 45	6 40	6 40
Massillon	Lv.	1 20	5 45	6 40	6 40
Bowerston	Ar.	2 55p. m.	7 35p. m.	9 40a. m.	9 40a. m.
Canal Dover		2 34p. m.	7 02p. m.	11 30a. m.	11 30a. m.
Newcomertown		3 13	7 46	12 09p. m.	12 09p. m.
Cambridge		4 08	8 37	1 02	1 02
Macksburg		5 39		2 30	2 30
Marietta	Ar.	6 55p. m.		3 38	3 38

WESTWARD.		No. 6.	No. 8.	No. 4.	No. 2*
Marietta	Lv.	7 00a. m.	11 00p. m.		
Macksburg		8 18	12 05		
Cambridge		9 52	1 27	5 30a. m.	
Newcomertown		10 47	2 20	6 20	
Canal Dover		11 30a. m.	2 54p. m.	6 55	
Bowerston		11 55a. m.	3 30p. m.	6 30a. m.	
Massillon		1 20p. m.	7 10	8 15	
Orrville	Ar.	1 55	8 20	8 55	
Orrville	Lv.	2 00	10 15*	8 55	
Creston	Lv.	2 30	10 45	9 25	
Wellington		3 18	11 28	10 12	*
Norwalk		4 10	12 10	11 25	7 25a. m.
Monroeville		4 22	12 25a. m.	11 37	7 37
Bellevue		4 40	*	11 55	7 53
Clyde		4 56		12 10p. m.	8 08
Fremont		5 13		12 30	8 25
Oak Harbor		5 41		12 55	8 48
Toledo	Ar.	6 35p. m.		1 55p. m.	9 45a. m.

No. 29.	No. 27.	NORWALK & HURON.		No. 26.	No. 28.
5 15p. m.	11 40a. m.	Ar.	Huron	Lv.	6 25a. m.
4 30p. m.	10 45a. m.	Lv.	Norwalk	Ar.	7 15a. m.
* Daily.					

This road is now open through from Toledo to Bowerston, connecting with the Pennsylvania System for all points East.

THROUGH CAR SERVICE—Between Toledo, Cambridge and Marietta; Toledo and Bowerston; Toledo and Akron, Youngstown and Pittsburgh; Chicago, Akron, Youngstown and Pittsburgh.

M. D. WOODFORD,
General Manager.

JAMES M. HALL,
Gen'l. Pass. Agent.

The PITTSBURGH & WESTERN RAILROAD Time Table

IN EFFECT OCT. 11th, 1886.

Central Standard Time, one hour slower than Eastern Time.

NORTHERN DIVISION.					
SOUTHBOUND TRAINS.					
STATIONS.			25	17	
Bradford.....Lv.		P. M.	A. M.	A. M.	
				8 15	
Kane.....Lv.					
Sheffield Junction.....				10 46	
Marienville.....				11 40	19
Tylersburg.....				12 20	P. M.
Clarion Junction.....				1 00	
Clarion.....			7 00	1 40	4 00
Shippensburg.....			6 30	1 15	3 30
Knox.....	23		7 12	1 53	4 14
St. Petersburg.....			7 30	2 08	4 33
Foxburg.....	A. M.		8 20	2 48	5 20
Parker.....	5 40		8 50	3 25	5 40
Bruin.....	5 50		9 00	3 42	
Petrolia.....	6 08	P. M.	9 20	4 02	P. M.
Karns.....	6 18		9 32	4 15	
Millerstown.....	6 22	27	9 38	4 20	9
St. Joe.....	6 36		9 55	4 38	
Butler.....	6 50	A. M.	10 08	4 53	P. M.
Renfrew.....	7 20		10 40	5 40	1 55
Callery Junction.....	7 41	8 55	11 00	6 00	2 11
Allegheny.....Ar.	8 10	9 20	11 25	6 25	2 35
	10 30	10 30	12 40	7 35	3 58
	A. M.	A. M.	P. M.	P. M.	P. M.
NORTHBOUND TRAINS.					
STATIONS.			4	8	18
Allegheny.....Lv.	A. M.	A. M.	A. M.	P. M.	P. M.
Callery Junction.....	6 00	9 20	7 20	1 46	5 35
Renfrew.....	7 30	10 40	8 35	3 10	6 50
Butler.....	7 58	11 00	8 55	3 34	7 12
St. Joe.....	8 20	11 20	9 16	3 55	7 33
Millerstown.....			9 45	4 25	8 00
Karns.....			10 30	4 38	8 14
Petrolia.....			10 15	4 54	8 28
Bruin.....			10 20	5 00	8 32
Parker.....			10 32	5 10	8 43
Foxburg.....			10 52	5 28	9 00
St. Petersburg.....			6 25	11 25	6 00
Knox.....			6 44	11 40	6 16
Shippensburg.....			7 44	12 24	7 02
Clarion Junction.....			8 06	12 41	7 20
Clarion.....			8 24	12 55	7 30
Tylersburg.....			9 00		8 00
Marienville.....					1 30
Sheffield Junction.....					2 08
Kane.....Ar.					2 50
					3 50
Bradford.....Ar.					6 25
	A. M.		P. M.	P. M.	

Westbound trains leave Callery Junction as follows:

Cleveland and Toledo Express 8.35 a. m., New Castle Accommodation 3.10 p. m., Chicago Express, with through Sleeping Car 4.38 p. m., Zelenople Accommodation 6.50 p. m.

No. 17 makes direct connection at Allegheny with B. & O. R. R. for Washington and Baltimore.

No. 19 connects at Foxburg with A. V. R. R. for Franklin and Oil City.

SUNDAY TRAINS Nos. 23 and 26 will run daily. Nos. 18 and 17 will run daily between Butler and Allegheny. No. 23 connects at Callery Junction for Allegheny and New Castle. No. 26 gets connections from Allegheny and New Castle. All other trains run daily, except Sunday.

THOS. M. KING, General Manager.

C. W. BASSETT, General Passenger Agent.

Pittsburgh & Lake Erie R. R. Time Table.

IN EFFECT MAY 10, 1886.

[Read Down.]	Central Time.	[Read Up.]
5 00a.m.	Bradford.....	6 20p.m.
5 30a.m.	Salamanca.....	4 13p.m.
6 45a.m.	Jamestown.....	3 08p.m.
9 20a.m.	Meadville.....	12 50p.m.
10 55a.m.	Youngstown.....	10 35a.m.
12 52p.m.	Shousetown.....	8 26a.m.
1 30p.m.	Pittsburgh.....	7 45a.m.
		11 35a.m.
		8 00a.m.
		7 09a.m.
		5 15a.m.
		1 25a.m.
		11 25p.m.
		10 45p.m.

W. C. Quincy,
General ManagerA. D. Smith,
General Pass. Agent.

PENNSYLVANIA RAILROAD—P. & E. DIVISION.

On and after Nov. 15, '86, trains will leave Emporium as follows:
For Harrisburg, Baltimore, Washington and the South, Philadelphia, New York and the East, 8:25 a. m., and 9:05 p. m. on week days. Pullman sleeping car on the 9:05 p. m. from Emporium to Philadelphia and from Williamsport to Washington.For Erie and intermediate stations, 10:35 a. m. week days.
For Kane and intermediate stations, 10:35 a. m. and 6:30 p. m. on week days.
J. R. WOOD, Gen'l Pass. Agent.
CHAS. E. PUGH, General Manager.

DUNKIRK, ALLEGHENY VALLEY & PITTSBURGH R.R.

JUNE 20, 1886.

Going North.	Express No. 2.	Mail No. 4.	Sunday No. 6.
Titusville, leave.....	7 35a.m.	3 20p.m.	7 55a.m.
Grand Valley.....	8 03a.m.	3 48p.m.	8 01a.m.
Irvinton.....	8 45a.m.	4 36p.m.	8 44a.m.
Warren.....	8 58a.m.	4 53p.m.	8 56a.m.
Junction.....	9 55a.m.	5 45p.m.	9 48a.m.
Lily Dale.....	10 50a.m.	6 36p.m.	10 37a.m.
Dunkirk, arrive.....	11 25a.m.	7 10p.m.	11 12a.m.
Going South.	Mail No. 1.	Express No. 3.	Sunday No. 5.
Dunkirk, leave.....	9 25a.m.	4 00p.m.	2 40p.m.
Lily Dale.....	10 03a.m.	4 38p.m.	3 14p.m.
Junction.....	11 02a.m.	5 45p.m.	4 08p.m.
Warren.....	11 55a.m.	6 44p.m.	5 06p.m.
Irvinton.....	12 10a.m.	7 00p.m.	5 22p.m.
Grand Valley.....	12 58p.m.	7 49p.m.	6 12p.m.
Titusville Ar.....	1 20p.m.	8 15p.m.	6 40p.m.

Baltimore & Ohio Railroad Time Table.

Depot corner Grant and Water streets, Dec. 13, 1885. Trains will arrive and depart on Eastern Standard time.

For Washington, D. C., and Baltimore, 8:35 a. m., limited, with Parlor car, and 9:20 p. m. daily.

Uniontown, 6:20 a. m., 1:10 and 4:00 p. m.

West Newton, 5:15 and 7:30 p. m.

McKeesport, 7:20, 10:15 a. m., 12:05, 3:20, 4:30, 5:50, 6:40, 9:50 and 11:45 p. m.

From Washington and Baltimore, 7:00 a. m. and 7:35 p. m., daily.

Uniontown, 10:00 a. m., 2:30 and 5:45 p. m.

From West Newton, 8:30 a. m. and 11:00 p. m. McKeesport, 6:50, 7:25, 8:00, 9:00, 11:35 a. m., 1:10, 5:30, 6:20 and 8:00 p. m. Sunday trains leave 8:35 a. m., 1:00, 7:30, 9:20, 9:50 and 11:45 p. m. Arrive 7:00, 9:00, 10:20 a. m., 7:35, 7:20 and 11:00 p. m.

WHEELING AND COLUMBUS DIVISION.

For Wheeling, 6:50 and 8:40 a. m., 3:30 and 8:00 p. m.

Columbus, Cincinnati, 6:50 a. m. and 8:00 p. m. Chicago express 3:30 p. m. Washington accommodation, 5:30 p. m. Sleeping car for Columbus and Cincinnati.

From Wheeling, Columbus, Cincinnati and Chicago, 8:20 and 11:15 a. m., 4:45 and 9:40 p. m. Washington acc., 8:10 a. m.

C. K. LORD, General Passenger Agent.

B. DUNHAM, General Manager.

E. P. SMITH, Division Passenger Agent.

SHENANGO & ALLEGHENY R. R.

TAKES EFFECT MONDAY, OCT. 11, 1886.

Trains are run by Standard Central Time (90th Meridian.)

NORTHWARD.			STATIONS.			SOUTHWARD.		
6	4	2				1	3	5
P. M.	P. M.	A. M.				A. M.	A. M.	P. M.
8 05	2 25	10 40	Ar.....	Greenville.....	Dp	6 07	11 10	3 20
7 55	2 15	10 30		Shenango.....		6 17	11 20	3 33
7 41	1 59	10 17		Kremis.....		6 29	11 31	3 44
7 31	1 47	10 08		Fredonia.....		6 37	11 40	3 52
7 24	1 40	10 02		Coolspring.....		6 42	11 45	3 56
7 23	1 38	10 01		Kerby Siding.....		6 43	11 46	3 57
7 12	1 26	9 50		Mercer.....		6 57	11 58	4 08
7 02	1 15	9 40		Pardee.....		7 07	12 08	4 17
6 57	1 07	9 36		Filer.....		7 11	12 12	4 22
6 49	1 00	9 29		Grov. City.....		7 19	12 22	4 28
6 46	12 55	9 26		Re d.....		7 20	12 24	4 30
6 35	12 40	9 16		Harrisville.....		7 33	12 40	4 41
6 30	12 34	9 12		Wick.....		7 37	12 45	4 45
6 25	12 29	9 07		Branchton.....		7 42	12 50	4 50
6 22	12 25	9 05		Coalton Junction.....		7 44	12 52	4 52
6 19	12 22	9 03		Keisters.....		7 47	12 55	4 55
6 11	12 14	8 56		Hallston.....		7 56	1 03	5 02
6 02	12 04	8 46		Euclid.....		8 07	1 13	5 11
5 53	11 54	8 37		Jamisonville.....		8 17	1 22	5 19
5 45	11 45	8 30		Oneida.....		8 30	1 31	5 25
5 35	11 35	8 20		P. & W. Junction.....		8 40	1 42	5 35
5 25	11 30	8 15	Dp.....	Butler.....	Ar	8 43	1 45	5 37
				Pittsburgh & Western R. R.				
3 30	9 20	6 00		Allegheny.....		10 30	3 58	7 35
P. M.	A. M.	A. M.				A. M.	P. M.	P. M.

HILLIARD BRANCH.

10		12		STATIONS.		9		11	
A. M.	A. M.					A. M.	P. M.		
12 00	7 30	Ar.....	Branchton.....	Dp		9 10	6 36		
11 50	7 20		Bovard.....			9 20	6 35		
11 30	6 56		Annandale.....			9 40	7 00		
11 20	6 48		Roy.....			9 50	7 10		
11 00	6 40	Dp.....	Hilliard.....	Ar		10 00	7 20		
A. M.	A. M.					A. M.	P. M.		

Trains 4 and 5 run daily with through coach service between Allegheny, Chautauqua Lake and Jamestown, N. Y. All other trains daily except Sunday.

I. D. STINSON, G. P. A.,
Greenville, Pa.J. T. BLAIR, Gen. Man.,
Greenville, Pa.

THE PETROLEUM AGE.

VOL. VI.

BRADFORD, PA., APRIL, 1887.

No. 3.

HON. JAMES K. BILLINGSLEY AND HOUSE BILL NO. 104.

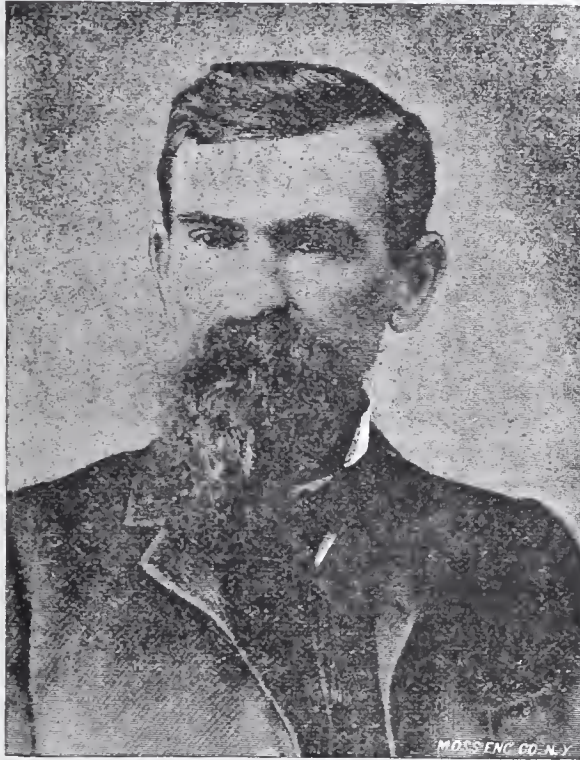
THE original House Bill No. 104, was introduced before the House of Representatives, at Harrisburg, on the 27th of January, 1887, by Captain James K. Billingsley, of Washington. It is safe to say that no Legislative measure has ever attracted such widespread and universal attention throughout the oil regions as this. The bill as first presented contained several very serious defects, but its object was at once recognized, and oil producers, as a whole, were of the opinion that it was destined to materially assist the business of petroleum producing and refining. As positive proof that this opinion was correct, came the voluntary concession by the National Transit Company, the corporation engaged in handling and transporting, at least 90 per cent. of the entire

production, of two of the most important points made in the bill. This action on the part of the storage and pipeage company, was a practical admission of the fact that the present rate of charges was altogether too high.

The bill provides that two per cent. shall be taken on account of loss by waste and evaporation, instead of three. This has been conceded. The bill provides that fifteen cents per day shall be charged for the storage of 1000 barrels of oil, instead of forty. The National Transit Company has voluntarily reduced the price to twenty-five cents per day. The bill provides that fifteen cents per barrel shall be charged for piping oil within a distance of fifty miles from the place where received. This point has not been conceded.

In connection with the general discussion, that has taken place over the bill, the AGE takes great pleasure in presenting to its readers an authentic portrait of the Washington gentleman, who had the temerity to step forward and present a measure that should cut down in a degree the enormous profits of a great corporation and alleviate, to some extent, the financial burdens of the oil producer.

Hon. James K. Billingsley was born in Washington county, Pa., on the 23d of January, 1836. His education was received at California, in the same county. For eight years he was a public school teacher, but is at present engaged in farming. He enlisted as a private for three years in the West Virginia infantry and returned with the rank of Captain. He was an officer in the Internal Revenue service from 1868-1874. His face



HON. JAMES K. BILLINGSLEY.

is by no means a new one at Harrisburg, having represented his constituents in the House for the sessions of 1875, 1876, 1877, 1878 and 1881. He was appointed Postoffice Inspector in August, 1883, and served to July, 1885, when he resigned, and has since been elected to serve his county in the present House of Representatives.

THE AMENDED BILLINGSLEY BILL.

In the February number of the AGE, the original of House Bill, No. 104, was presented in full. The amended bill, which is now under discussion, is presented below :

An Act to regulate the business of transporting and storing crude petroleum of gravity exceeding thirty-five degrees, Baume, at a temperature of sixty degrees, Fahrenheit, within this Commonwealth.

SECTION 1. Be it enacted by the Senate and House of Representatives of the Commonwealth of Pennsylvania, in General Assembly met, and it is hereby enacted by the authority of the same, That it shall be the duty of every corporation and partnership association, limited or otherwise, and of all and every other person and persons now or hereafter engaged in the business of transporting and storing crude petroleum of gravity exceeding thirty-five degrees, Baume, at a temperature of sixty degrees, Fahrenheit, by means of pipes and tanks to deliver all such petroleum received by them respectively for storage and transportation, or either, or petroleum of like kind and quality at any point within this Commonwealth, reached by their respective pipe lines used for the transportation of petroleum of like quantity which the owner of such petroleum may designate for such delivery.

SECTION 2. That no corporation, partnership association, limited or otherwise, or other person or persons now or hereafter engaged in the business of transporting and storing of crude petroleum of gravity exceeding thirty-five degrees Baume at a temperature of sixty degrees Fahrenheit, by means of pipes and tanks shall hereafter demand or receive any compensation in excess of fifteen cents for each barrel of forty-two gallons of such petroleum for all services performed in receiving, storing for any period not exceeding thirty days, transporting and delivering the same or other petroleum of like kind and quality at any point not more than fifty miles distant from the point where the same shall have been received, and six cents additional per

barrel of forty-two gallons for each additional fifty miles or fractional part thereof that the same may be transported in any cases of a transportation which shall begin and end in this Commonwealth.

SECTION 3. That no corporation, partnership association, limited or otherwise, or other person or persons, now or hereafter engaged in the business of transporting and storing crude petroleum of gravity exceeding thirty-five degrees Baume, at a temperature of sixty degrees Fahrenheit, by means of pipes and tanks, shall demand or receive of or from the owner or owners of any such petroleum, any compensation for the storage thereof after the first thirty days after the same shall have been delivered to it, him or them for transportation and storage, in excess of three two-hundredths part of one cent per day (15c) for each barrel of forty-two gallons so long as the same shall remain in such custody.

SECTION 4. That no corporation, partnership association, limited or otherwise, or other person or persons engaged in the business of transporting and storing crude petroleum of gravity exceeding thirty-five degrees Baume, at a temperature of sixty degrees Fahrenheit, by means of pipes and tanks, shall deduct from any such petroleum received by them respectively for transportation and storage more than two per centum thereof, or make other charge for water, sediment, waste and the like, and all or every such corporation, person or persons, shall make such deduction or charges at the time when such petroleum shall be so received and at no other time. Provided, that in case of loss of any petroleum while in the custody of any such corporation, partnership association, or other person or persons, caused by fire, lightning, storm or other unavoidable cause, such loss shall be borne pro rata by the owners of all the petroleum in such custody at the time thereof.

SECTION 5. If any person or persons, partnership association, limited or otherwise, or corporation engaged in the business of transporting and storing crude petroleum within this Commonwealth, shall violate any of the provisions of this act, the person or persons so offending, and any president, chairman, director, manager or other officer or agent of any such corporation or limited partnership association so offending, who shall directly or indirectly participate in, assent to or knowingly permit any such violation, shall be guilty of a misdemeanor, and upon conviction thereof shall be sentenced to pay a fine not exceeding five thousand dollars to the person or persons injured and undergo an imprisonment not exceeding two years for each offense.

The Refined Market.

The refined market has displayed evidences of considerable improvement, but quotations have remained unchanged, on the basis of 6½c for 70° Abel test. Freight rates have ruled low, and the foreign buyer is growing tired of waiting for further mark down in the price of the refined article. A sudden stiffening of crude values would bring about an increased demand for refined.

The exports of refined, crude and naphtha, from all ports, from January 1 to April 2 have been as follows:

	1887. Gallons.	1886. Gallons.
From Boston.....	1,188,420	1,195,879
Philadelphia.....	30,251,905	29,363,788
Baltimore.....	1,894,689	2,914,987
Perth Amboy.....	3,365,516	718,086
Total.....	36,700,530	34,192,740
From New York.....	81,114,237	95,214,803

Total exports from United States.....120,814,767 129,407,548

Refined for home trade is in moderate request with

the following quotations: 8@8½c for New York State legal test, 7@7½c for 110° test, 8@8¼c for New York city 110° flash, and 9@9¼c for New York city 150° water white. Western lots are offered at 6¾@7c for 110° test Standard white, 7¼@7½c for 120° test Standard white, 7½@7¾c for 130° test Standard white, and 8¾@9c for 150° test water white. Western naphtha 68° to 72° test is quoted at 7½@8c delivered in New York.

The demand for refined in cases is steadily increasing, with quotations of 8½ to 9½c., according to brand. The clearances for March in this class of goods to China and the East amounts to 1,157,823 cases, a decrease of 900,786 cases from the same month in 1886. The total clearances to March 31, 1887, are 2,482,670 cases, a decrease of 1,875,460 cases, as compared with the corresponding period of the year preceding.

Mr. George H. Lincoln's monthly circular gives the following figures on the clearances of refined petroleum, in cases, for China and the East up to the 31st of March, for the years 1886 and 1887:

	1887. Cases.	1886. Cases.
China.....	395,138	1,337,688
Japan.....	760,275	299,992
India.....	824,457	1,637,839
Java, Singapore, etc.....	502,800	1,822,611
Total March 31st.....	2,482,670	4,358,130
Total February 28th.....	1,324,847	2,299,521
Clearances for March.....	1,157,823	2,058,609
Clearances for February.....	733,626	1,281,488
Clearances for January.....	591,221	1,018,033
Total.....	2,482,670	4,358,130

REFINED QUOTATIONS FOR MARCH.

	New York.....	Philadelphia.....	Baltimore.....	London and Liverpool.....	Bremen.....	Antwerp.....
	Cts.	Cts.	Cts.	Pence.	Marks.	Francs.
1.....	6½	6½	6½	5½	6.00	15¼
2.....	6½	6½	6½	5½	6.00	15¼
3.....	6½	6½	6½	5½	6.00	15¼
4.....	6½	6½	6½	5½	6.00	15¼
5.....	6½	6½	6½	5½	5.95	15¼
6.....	6½	6½	6½	5½	5.95	15¼
7.....	6½	6½	6½	5½	5.90	15¼
8.....	6½	6½	6½	5½	5.90	15¼
9.....	6½	6½	6½	5½	5.90	15¼
10.....	6½	6½	6½	5½	5.90	15¼
11.....	6½	6½	6½	5½	5.90	15¼
12.....	6½	6½	6½	5½	5.90	15¼
13.....	6½	6½	6½	5½	5.85	15¼
14.....	6½	6½	6½	5½	5.85	15¼
15.....	6½	6½	6½	5½	5.85	15¼
16.....	6½	6½	6½	5½	5.85	15¼
17.....	6½	6½	6½	5½	5.85	15¼
18.....	6½	6½	6½	5½	5.85	15¼
19.....	6½	6½	6½	5½	5.85	15¼
20.....	6½	6½	6½	5½	5.90	15¼
21.....	6½	6½	6½	5½	5.90	15¼
22.....	6½	6½	6½	5½	5.90	15¼
23.....	6½	6½	6½	5½	5.90	15¼
24.....	6½	6½	6½	5½	5.90	15¼
25.....	6½	6½	6½	5½	5.90	15¼
26.....	6½	6½	6½	5½	6.00	15¼
27.....	6½	6½	6½	5½	6.00	15¼
28.....	6½	6½	6½	5½	6.00	15¼
29.....	6½	6½	6½	5½	6.00	15¼
30.....	6½	6½	6½	5½	6.00	15¼
31.....	6½	6½	6½	5½	6.00	15¼

THE total exports of petroleum from America, in gallons, according to a German circular, from January 1 to March 4, for the years 1886 and 1887, have been as follows:

	1887. Gallons.	1886. Gallons.
To Europe.....	56,486,032	54,447,803
To East Indies, etc.....	15,754,175	26,910,740
Total.....	72,240,207	81,358,543

THE Excelsior Oil Company, of Oil City, has changed its name to the Keystone Oil Company, to avoid confusion arising from a similarity of titles.

RUSSIAN PIPE LINES.

HOW THE CZAR PROPOSES TO REGULATE THE PIPE LINE
BUSINESS BETWEEN THE BLACK AND
THE CASPIAN SEAS.

At the present time anything concerning pipe lines is of interest to the oil world. Inside and bed rock information, pertaining to the business of piping oil is at a premium. The earnings of pipe lines are easily ascertained through the official monthly statements, but the cost of construction, maintenance and managing of them are points more difficult to determine. Through a reliable source has come to us the copy of an official document which sets forth the conditions upon which the Russian government will grant a concession for the construction of a pipe line between the Caspian and Black seas.

Mr. James C. Chambers, United States Consular Agent at Batoum, on the Black Sea, is well-known in Bradford and throughout the oil region. In his elaborate report on the Russian Petroleum Trade, written November 1, 1886, he gives a description of the railway from Baku, on the Caspian Sea, to Batoum, on the Black Sea, which will afford a good idea of the country over which the pipe line must be laid if it is ever constructed.

"The railway from Batoum to Baku is 560 miles long, and is an exceedingly expensive road to operate, owing to the heavy grades in crossing the mountains. The highest point upon the road is the Suram Pass, about 135 miles west of Batoum, which is over 3000 feet above the level of the Black Sea. Upon the west side of the mountain the average grade for $3\frac{1}{2}$ miles is 185 feet to the mile, and $1\frac{1}{2}$ miles of it is 238 feet to the mile. Upon the east side of the mountain there is a grade of 253 feet to the mile, but the greatest grade shown by the official statistics is 238 feet to the mile for nearly two miles, while the average grade for six miles is 210 feet to the mile."

In THE PETROLEUM AGE for November, 1886, mention was made of a Russian pipe line, which might be constructed under nearly the same conditions as are outlined in the appended document:

The following are the conditions approved by the joint council of the Ministries of Finance and State Domain, upon which a concession will be granted by the Russian government for the construction of a pipe line from Baku to Batoum:

First—The pipe line must serve the public as a means of transportation.

Second—The whole working time of the pipe line, the order of its use and the delivery of the oil carried by it, are to be under the most strict government control. The duties of the controllers will be hereafter arranged in detail by the Ministry of State Domain in mutual agreement with the Ministry of Finance, covering the following points: Seeing that all oil piped is owned exclusively by those having no interest in the pipe line; keeping correct account of the loss in piping; the percentage of loss to the shippers by the pipe line must be calculated accurately for the first working year, and in any case must not exceed 3 per cent. of the quantity shipped to any distance.

Third—The pipe line must be constructed and conducted so that its stoppages caused by technical errors shall not exceed twelve in any one year, and the length of time of stoppage should not exceed three days. Its

capacity must not be less than 40,000,000 poods (200,000,000 gallons) per year.

Fourth—When the actual demand for piping reaches 36,000,000 poods per year, then the company must within two years from such time construct an additional line of sufficient capacity to increase its total piping capacity 60,000,000 poods (300,000,000 gallons) per year.

Fifth—The maximum rate of pipeage charges for the entire length of the line from the wells to the Black Sea terminus, when the volume of oil piped does not exceed 30,000,000 poods per year, shall be *11 kopecks per pood; when the business exceeds 30,000,000 poods per annum, * $10\frac{1}{2}$ kopecks per pood, and when it exceeds 40,000,000 poods per annum, *10 kopecks per pood; the rate of pipeage charged to way stations shall be reduced from this rate proportionately with the distance, and special rates for this will be arranged with the approval of the Ministry of State Domain. Changes in the pipeage rates must be given notice of one month before being enforced.

Sixth—The right to construct the pipe line is at the disposal of any one who wishes to undertake it (without any guarantee from the government) by shares or by other obligations, if the latter shall be permitted.

Seventh—The owners of the pipe line will not be permitted to engage in the business of producing, refining or trading in petroleum products.

Eighth—The individual or company undertaking the construction of the pipe line must have half the work completed (meaning the laying of pipe and construction of stations) in two years from the date of acceptance of the concession; but the final completion and opening of the line for working the whole distance, between the Caspian and Black Seas, must not be later than three years from the date of the formation of the company and the establishing of its statutes, (rules and regulations).

Ninth—The contractors and owners of the pipe line shall be allowed three years to construct it, and twelve years in which to benefit by it. During this time (fifteen years) to protect the line from competition no other pipe line shall be allowed to be constructed, exception to this can only follow the failure of the company (owners of the line) to fulfill to the letter the rules and conditions it accepts.

NOTICE.—The piping of both refined oil and distillate by the company is strictly forbidden.

Tenth—The company must prepare all pipes and tanks necessary at Russian works and from Russian material.

Eleventh—The company must pay to the government $\frac{1}{2}$ kopeck per pood (about $1\frac{3}{4}$ cents per barrel of 42 gallons) for every pood of oil it pipes to the Black Sea, when the quantity piped exceeds 30,000,000 poods per annum. The amount to be paid to the government for oil piped to way stations shall be fixed proportionally with the distance piped.

Twelfth—The constructors of the line for purposes of construction are allowed to make use of ground necessary. All untenanted, uncultivated and untimbered government lands are given over to the company gratis in such quantities as are necessary for the laying of pipe and building of stations. In like manner the company is allowed, with the permission of the authorities, to take from the untenanted, uncultivated and untimbered government lands nearest the pipe line building material

* At present rate of exchange 11 kopecks per pood is 39 cents per barrel of 42 gallons; $10\frac{1}{2}$ kopecks per pood is 37 cents per barrel, and 10 kopecks per pood is 35 cents per barrel.

such as *stones, sand, gravel, clay and lime* necessary for the construction of the pipe line.

Thirteenth—The company shall have the right to pipe for itself, as company's property, petroleum for fuel gratis, which petroleum can be purchased when needed or produced from land specially designated for the production of fuel for the pipe line in such quantities as are absolutely necessary for the proper working of the line. The quantity of petroleum necessary for fuel is to be determined by the amount used in the first working year of the line, but must under no circumstances exceed 10 per cent. of the whole quantity of oil piped by the line.

Fourteenth—The Minister of State Domain may receive the proposal of any and all who wish to construct the pipe line, and with the aid of the Minister of Finance to choose from the competitors that person or company in whom it will be acknowledged the government has the greatest confidence, and who can in the interest of the business itself give the best guarantee for the soundness of the company to be established and for the success of the enterprise.

Fifteenth—Upon the selection in the foregoing manner of a person or company for the construction of this crude oil pipe line, the person so selected must form his company and deposit a bond and present a statute (rules and regulations) within six months of the date of the receipt of the concession. The bond required by the government to be deposited by the holder of the concession is not to be returned to him until after the correctness of the construction of the pipe line has been certified to, which certification must not be later than one month from the receipt of notice from the company of the completion of the construction. The Minister of State Domain will lay the regulations of the company before the Committee of Ministers.

Sixteenth—All the construction at the expiration of seventy-five years passes to the possession and ownership of the government.

In addition to the above sixteen conditions the council resolved that the builders of the pipe line must obtain all machinery necessary for the line from Russian manufacturers or manufacture it in Russia.

OIL REGION CHRONOLOGY.

FOR MARCH, 1887.

March 1.—AGE oil report shows 147 wells completed in February, 24 of which are dry; new production, 8061 barrels; new rigs, 66; old rigs, 120; drilling wells, 172; total field operations for February, 358; decrease from January figures, 40. Lima—*Times* report shows 34 wells completed in February, with 3240 barrels new production; number producing wells to date, 404; production, 7500. Market opened at 61¼c, the lowest point of the day, advanced with many reactions to 64½c and closed at 63¾c. Carrying rates—Oil City and Pittsburgh, 45c; New York, 55c; Bradford, 50c. Reibold—Phillips, Markle, No. 3, gets lower pay streak and increases from 12 to 75 barrels an hour; Leidecker, No. 6, Heid, 25 feet in sand and making 50 barrels an hour; production of field, 8000 barrels. Two boys injured near Kane City, Venango county, by explosion of an old torpedo shell. Maynard Stranahan, aged 17, fatally hurt.

March 2.—Market opened at 63¾c, broke to 63¾c and advanced to 63¾c. It again fell off and then boomed to 64½c. It afterwards sold off and closed at 62¼c. Reibold—

Production, 7800 barrels; Phillips, Markle, No. 3, declines to 47 barrels an hour, and increased by agitation to 68 barrels; Leidecker, Heid, No. 6, starts at 20 barrels an hour; No. 5, is doing 30; No. 4, 27 barrels an hour.

March 3.—Market opened steady at 62½c, advanced to 63¼c, sold off to 62¼c and closed at 62¾c. Reibold—Phillips, Markle, No. 2, 20 and No. 3, 45 barrels an hour; Phillips, No. 1, Galebaugh, strikes oil and gas unexpectedly in the "100-foot" and burns the derrick. Washington—Wright, No. 5, 325 barrels a day; McGahey, No. 6, 15 barrels an hour. Hodge farm well at Kinzua Village, starts at 30 barrels an hour.

March 4.—Market opened at 62¼c, advanced to 63¾c, sold down to 62¾c and closed at 63c bid. Reibold—Leidecker, Blakeley, No. 1, 60; Heid, No. 4, 38; No. 5, 20 barrels an hour; Phillips, No. 4, Markle, starts at 10 barrels an hour; No. 3, increased from 50 to 60 barrels an hour; pool gauges, 5747 barrels from 31 wells. Washington—Wright, No. 5, nearly through sand and doing 12 barrels an hour. Solar, No. 21, Shannopin, starts at 100 barrels an hour, and between 5 and 6 p. m. gauged 182 barrels.

March 5.—Market opened at 62½c, advanced to 63c, broke to 62¾c, firmed up to 63¾c and closed at 63c bid. Carrying rates 40 to 55c. Washington gauge 7454 barrels from 155 wells. Reibold—Phillips, Markle, No. 4, strikes lower pay streak and increases from 7 to 50 barrels an hour; No. 3, 45, and No. 2, 17 barrels an hour. W. N. George, of Duke Centre, acquitted by the jury at Smethport, of the charge of the theft of 10,000 barrels of oil from the National Transit Company, the company being unable to prove that any oil has been taken.

March 6.—Sunday. Phillips, Markle, No. 2, Reibold, doing 40 barrels an hour. Solar, No. 21, Shannopin, gauges 60 barrels per hour. House of Patrick Sweeney burned at Olean; loss, \$1500.

March 7.—Market opened strong at 63½c, advanced with many small breaks to 64c and closed with sales at 63¾c. Reibold—Phillips' wells gauge, Markle, No. 2, 320; No. 3, 1020; No. 4, 470; Blakeley, No. 1, 240; No. 2, 600; No. 3, 240; Heid, No. 4, 180 barrels past twenty-four hours. Solar, No. 21, Shannopin, gauges 40 barrels an hour.

March 8.—Market opened at 63¾c, the highest point, and broke to 62c. It reacted to 62½c, but afterwards sold down to 61¾c and closed at 61½c. Carrying rates 45c to 55c. Reibold production 3984 barrels. All the large wells are rapidly falling off. Phillips, Markle, No. 2, 15; No. 3, 37; No. 4, 13 barrels an hour; Blakeley, No. 1, increased by shot to 37 barrels an hour. Lima pipe line runs to-day, 15,455 barrels. Twelve divorces granted at the Crawford county court. John J. Carter issues a call for a producers' committee to meet representatives of the National Transit Company at New York, and discuss the matters involved in the Legislative measure, known as the Billingsley bill.

March 9.—Market opened at 61¾c, firmed up to 62¾c, declined to 61¾c and closed at 61¾c. Reibold—Phillips wells gauge for twenty-four hours as follows: Markle, No. 2, 270; No. 3, 840; No. 4, 275; Blakeley, No. 1, 810; No. 2, 512; Heid, No. 3, 180; No. 4, 170 barrels; Galebaugh, No. 1, 100 barrels. Solar, No. 21, Shannopin, 35 barrels an hour.

March 10.—Market opened at 61½c, advanced to 62¾c, then to 63¾c, sold down to 62½c, reacted to 63½c and closed at 62¾c. Reibold—Phillips, Blakeley, No. 1, 570; No. 2, 495; Markle, No. 3, 750 barrels a day; Leidecker, Blakeley, No. 1, 15 barrels an hour; No. 6, 55

barrels a day. Collins & McCalmont, No. 8, Weed lands, at Kinzua Village, showing for 300 barrels. Solar, No. 21, Shannopin, increased by deeper drilling to 76 barrels an hour. The Billingsley pipe line bill, which was to have come before the Legislature to-day, postponed one week. Committee representing oil region at Harrisburg issue a circular stating that no compromise in regard to charges, with National Transit Company is desired.

March 11.—Market opened at $63\frac{1}{8}$ c, firmed up with numerous fluctuations to 64c, broke to $63\frac{5}{8}$ c and closed at $63\frac{7}{8}$ c. Carrying rates—New York, 60c; Bradford and Oil City, 50c; Pittsburgh, 45c. Reibold—Phillips, Markle, No. 4, shot and starts at 16 barrels an hour; Markle, No. 5, 8 feet in sand and making 50 barrels an hour; pool gauges, 4315 barrels from 38 wells. Riot in Union Church, at Turkey City, and a big fight among Larkins Bros' pipe line laborers, at Kane. Ex-President Hayes gets a good gasser near his residence at Fremont, Ohio.

March 12.—Market opened steady at $63\frac{7}{8}$ c, firmed up to $64\frac{1}{8}$ c, broke off to 63c, shortly afterwards Marlin sold 100,000 at 62c, the lowest point of the day. It rallied to $63\frac{3}{8}$ c, weakened to $62\frac{3}{4}$ c and closed at 63c. Carrying rates—New York, 60c; Bradford and Oil City, 50c; Pittsburgh, 45c. Washington gauge 7358 barrels from 155 producing wells.

March 13.—Sunday. Reibold—Phillips, Markle, No. 1, 32; No. 2, 12; No. 3, 30; No. 4, 8; No. 5, 14 barrels; Blakeley, No. 1, 10; No. 2, 19 barrels an hour. Small house burned on Pleasant street, Bradford. Solar, No. 21, Shannopin, 60 barrels an hour.

March 14.—Market opened steady at 63c, advanced to $63\frac{5}{8}$ c, sold down to $62\frac{3}{4}$ c and closed at $62\frac{7}{8}$ c bid. Washington—Union, No. 1, Workman farm, makes its first flow. Hukill's well, at Mt. Morris, in Greene county, reported to have averaged 75 barrels a day.

March 15.—Market opened at $63\frac{1}{8}$ c, fluctuated between $63\frac{1}{2}$ c and $63\frac{1}{8}$ c and closed at $63\frac{1}{4}$ c bid. Carrying rates 45c to 55c. Washington—Union, No. 1, Workman, made 138 barrels first fifteen hours. Reibold—Phillips, Markle, No. 6, starts at 35 barrels an hour. J. J. Carter's committee of oil producers meets the Standard officials at Fifth Avenue Hotel, New York. Saltzman & Son's brewery, at Oil City, destroyed by fire; loss, \$20,000.

March 16.—Market stronger; opened at $63\frac{3}{8}$ c, advanced to $64\frac{3}{4}$ c, receded to $64\frac{1}{8}$ c and closed at $64\frac{1}{4}$ c. Reibold wells show a marked decline. Phillips, Markle, No. 6, 25 feet in sand and making 25 barrels an hour; Markle, No. 5, 5 barrels an hour; Blakeley, No. 2, 390 barrels a day. Washington—Workman, No. 1, increased to 27 barrels an hour. Meeting of Colonel Carter's committee and the Executive Committee of the Standard Oil Company.

March 17.—Market opened firm at $64\frac{3}{4}$ c, advanced to $65\frac{1}{8}$ c, settled off to $64\frac{3}{4}$ c, reacted to 65c, and then broke rapidly to $62\frac{3}{4}$ c. It afterwards strengthened and closed at $63\frac{3}{4}$ c bid. Reibold—Phillips, Markle, No. 6, strikes the lower pay streak and increased to 60 barrels an hour. Washington—Workman, No. 1, made 250 barrels last twenty-four hours. Legislature appropriates \$5,000 for the Bradford Hospital. Billingsley bill passes second reading in the House. Compromise agreed to between Carter's committee and the National Transit Company at New York, on the basis of 25 cents per 1000 barrels a day. John P. Zane hung in effigy in the Public Square, Bradford.

March 18.—Market opened at 64c, firmed up to $64\frac{1}{4}$ c,

broke to $63\frac{3}{8}$ c and closed at $63\frac{3}{4}$ c bid. Washington—Workman, No. 1, 70 barrels an hour at 1 p. m. and drops off to 45; Workman, No. 2, starts at 75 barrels an hour when 8 feet in the sand, but drops rapidly to 35 barrels. Representative Johnson presents to the Legislature a petition with over 2000 names from McKean county, asking for the passage of the Billingsley bill. Officer S. W. Trucks, of Bradford, arrested, charged with manslaughter in the case of C. E. Vosburg, who died in the lockup January 13th.

March 19.—Market dull and uninteresting; opened at $63\frac{3}{4}$ c, advanced very slowly to $64\frac{1}{8}$ c and closed at $63\frac{7}{8}$ c. Carrying rates 45c to 55c. Stone & Co.'s well, Sheller farm, Taylorstown, reported a failure. Washington production 7232 barrels from 157 wells. Four wells torpedoed the past week. Workman, Nos. 1 and 2, 360 barrels each; Davis, No. 7, 480 past twenty-four hours. In the afternoon Workman, No. 2, dropped off to 12 barrels an hour. A bill to regulate pipe line charges in the State of Ohio, defeated by the Ohio Legislature. The Bradford Board of Trade revived.

March 20.—Sunday. Fire at Chautauqua destroys fifty summer residences.

March 21.—Market opened at 64c, advanced to $64\frac{1}{8}$ c, declined and closed at $63\frac{1}{2}$ c. Carrying rates 45c to 55c. Production of Reibold pool down to 3800 barrels. Rousing meeting of Bradford producers at the Oil Exchange, and resolutions adopted rejecting all ideas of a compromise between oil producers and the National Transit Company on the question of storage and pipeage charges.

March 22.—Market opened at $63\frac{1}{2}$ c, the highest point of the session, and within ten minutes dropped to $62\frac{3}{4}$ c, the lowest point. It reacted to $63\frac{1}{8}$ c and closed at 63c. Carrying rates—New York, 50c; Pittsburgh, Oil City and Bradford, 50c. Reibold—Phillips, No. 8, Heid, 34 feet in the sand and showing for a small producer; Blakeley, No. 3, will also be small. Washington—Workman, No. 1, 285; No. 2, 200 barrels past twenty-four hours; Chartiers Oil Company, Fergus, No. 2, doing 225 barrels a day increased to 500 barrels from second pay streak. Warren producers endorse the Billingsley bill.

March 23.—Market opened at $63\frac{1}{8}$ c, sold down to $62\frac{5}{8}$ c and closed at $62\frac{7}{8}$ c. Washington—Workman, No. 1, made 300; No. 2, 200 barrels last twenty-four hours. Kane burglars lodged in Smethport jail. Mass meeting of producers at Clarendon endorsing the Billingsley bill.

March 24.—Market opened at 63c, vibrated between $63\frac{1}{8}$ c and $62\frac{3}{4}$ c and closed at 63c bid. Mr. Eckman's house, near Butler, struck by lightning, and his only son, aged 12 years, instantly killed and a daughter seriously burned. Severe wind storm does considerable damage in the Washington field. Large meeting of oil producers at Oil City Exchange and resolutions favorable to the Billingsley bill unanimously adopted.

March 25.—Market opened at $63\frac{1}{4}$ c, advanced to $63\frac{1}{2}$ c, sagged off to 63c and closed at $63\frac{1}{8}$ c. Carrying rates 45c to 50c. Reibold—Phillips, Markle, No. 2, shot and increased to 25 barrels an hour; No. 3, 390 barrels a day; Heid, No. 8, starts pumping and will make a 50 barrel well; Leidecker, Heid, No. 7, in sand and showing light, Washington—Davis, No. 6, through Gantz sand, but has made no flows; Workman, No. 1, 315 barrels a day from top of "50-foot;" No. 2, 240 barrels a day.

March 26.—Market opened at $63\frac{1}{8}$ c, firmed up to $63\frac{5}{8}$ c, settled to $63\frac{1}{2}$ c, advanced to $63\frac{3}{4}$ c, weakened to $63\frac{1}{2}$ c and closed at $63\frac{1}{2}$ c. Washington—Gauge 7476 barrels from 162 wells. Workman, No. 1, 480; No. 2, 300; Davis, No. 7, 445 barrels. Taylorstown wells—Mc-

Manus, 60; Blayney, 180; Noble, 215; Cundall, 160 barrels. Fergus, No. 2, 28 feet in Gantz sand and producing 340 barrels a day. A case of infanticide discovered at Franklin; no clue to the criminals.

March 27.—Sunday.

March 28.—Market opened very quiet at 63½c, remained between 63¼c and 63½c all day and closed at 63½c bid. Carrying rates 45c and 50c. Washington—The Workman wells drilling in the “50-foot” without improvement; No. 1, gauged 451; No. 2, 210 barrels last twenty-four hours; Fergus, No. 2, 280 barrels; Cameron, No. 9, 25 feet in sand and makes occasional flows; Davis, No. 6, through Gantz sand with very small showing. Small fire at Oil City Boiler Works, Oil City.

March 29.—Market opened at 63½c, sold down to 63c and closed at 63¾c bid. Reibold production about 3000 barrels. Phillips, Heid, No. 7, 3, and No. 8, 15 barrels a day; Markle, No. 2, 180; No. 3, 460; No. 5, 360; No. 6, 245 barrels a day. House of James Fisher, on Bissell avenue, Oil City, destroyed by fire; loss, \$1,000. A little son of J. P. McCracken, while playing in his father’s boiler house, near Kane City, Venango county, fires the boiler house and is fatally burned. A wagon load of nitro-glycerine rolls down a hill, near Kinzua Village, and fails to explode or to injure horses or driver.

March 30.—Market opened and closed at 63½c and remained all day between 63¾c and 63½c. Mealey & Co.’s well, at Tionesta, Bowman & Co.’s well, at New-manville, and Shannon & Kelley’s well, on 5504, Forest county, all pronounced dry.

March 31.—Market opened at 63½c, firmed up to 63¾c, receded to 63¾c and closed at 63½c. Carrying rates 45c to 55c. Washington—Gordon, No. 6, shot last evening, made 200 barrels the twelve hours ending this morning.

The Macksburg Field in March.

The production of the Macksburg field, estimated from the pipe line runs, the shipments of the West Virginia Transportation Company, etc., averaged about 229 barrels a day for 1884. The gross runs of the Macksburg pipe line since January 1, 1885, with the estimated amount of oil shipped from the field through other channels is given below. The averages represent the best obtainable figures on the production of the field:

	Macksburg P. L. Runs.	Outside Shipments. Est	Daily Average Production.
1885.			
January	11,894	1500	432
February	20,625	1500	790
March	27,067	1500	922
April	40,527	1500	1400
May	48,258	1500	1605
June	64,982	1500	2216
July	75,737	1500	2492
August	74,228	1500	2443
September	68,110	1500	2320
October	63,619	7000	2278
November	60,926	7000	2264
December	61,113	7000	2197
Total	617,086	34,500	1785
1886.			
January	54,806	7000	1994
February	49,694	7000	2025
March	58,795	8973	2116
April	64,137	7890	2401
May	58,596	6630	2104
June	65,379	2871	2275
July	58,410	4080	2016
August	57,492	2790	1945
September	48,918	1240	1672
October	46,937	3240	1619
November	41,359	4090	1515
December	40,578	3040	1407
Total	645,101	58,844	1682
1887.			
January	37,134	4500	1343
February	28,514	1200	1061
March	32,549	7400	1015

No wells were completed in the Macksburg field in March, and on the last day of the month there were three wells drilling. During February there were three wells finished with a new production of 20 barrels. On the 31st of March there were 466 producing wells in the field with an average daily yield of 2.2 barrels apiece. Two wells were abandoned during the month, and at the present time fifteen are temporarily stopped from various causes. The outside shipments for March were a drain on accumulated stocks.

Nothing is being done in the Eureka, West Virginia, oil field. Craig & Co.’s No. 2, at Moundville, West Virginia, was finished March 20th, and proved a fair gas well; the product will probably be utilized in the town.

Deep Wells.

The deepest drilled well in the United States is that of George Westinghouse, at Homewood, near the city of Pittsburgh, which on the 1st of December, 1886, had reached a depth of 4618 feet, when the tools were lost and drilling ceased. The Buchanan farm well, of the Niagara Oil Company, drilled by Fred Crocker, in Hopewell township, Washington county, is 4303 feet deep. The Rush well, of the Niagara Oil Company, in Washington county, was abandoned at 3300 feet. The deep well of Jonathan Watson, near Titusville, was drilled about 3500 feet. J. M. Guffey & Co.’s well, on the Walz farm, at West Newton, Westmoreland county, was drilled to a depth of 3500 feet. The well of Isaac Willets, at Sargent’s Mills, near Sycamore, in Greene county, was abandoned at 3008 feet.

The deepest bore hole in Europe is at Schladebach, near Kotschau Station, on the railway between Corbetha and Leipzig, and was undertaken by the Prussian government in search for coal. The apparatus used is a diamond drill, down the hollow shaft of which water is forced, rising again to the surface outside the shaft of the drill and inside the tube in which the drill works. By this method cores of about 50 feet in length have been obtained. The average length bored in twenty-four hours is from 20 to 33 feet, but under favorable circumstances as much as 180 feet has been bored in that time. Other deep holes are as follows:

	Feet.
Domnitz, near Wettin	3,287
Probat-Jesar, Mecklenburg	3,957
Sperenberg, near Zossen	4,173
Unseburg, near Stassfurt	4,242
Lieth-Elmsborn, Holstein	4,390
Schladebach	4,515

The dimensions of the bore hole at Schladebach are as follows:

Depths from surface.	Each size bore, Feet.	Diameter, Inches.
189’6	189’6	11’0
605’7	416’1	9’0
661’8	56’1	7’3
1,906’5	1,244’7	4’7
2,259’8	353’3	3’6
3,543’4	1,283’6	2’8
4,069’9	526’5	1’97
4,514’6	444’7	1’88

The various strata passed through are as follows:

	Feet.
Soil and sand, about	16
Clay	66
Sandstone (Bunter)	459
Anhydrite	59
Brine spring	—
Magnesian limestone (Zechstein)	144
Gypsum	26
Anhydrite	295
Marl slate (Kupfersheifer)	3
San istone (Kothliegende)	3,435

The bore hole, which in January, 1885, had reached a depth of 4560 feet, was commenced in June, 1880, but left after a year’s work, recommenced at the end of 1882, and is still progressing. The cost up to January, 1885, was about \$25,000.

THOMAS W. PHILLIPS' ARRAIGNMENT

OF THE STANDARD OIL COMPANY—A KEEN DISSECTION OF
PIPE LINE METHODS AND TOLLS.

PENNSYLVANIA supplies most of the world with petroleum, and every citizen of the Commonwealth is directly or indirectly interested in House bill No. 104, regulating the price for piping and storing crude oil. The present production of the State is about 60,000 barrels a day, and the proposed reductions of from 20c to 10c a barrel for piping, from 1c to ½c a month for storage, and from 3 per cent. to ½ per cent. for waste, would make a difference of over \$7,000 a day now taken from the land owner's royalty and the producer's profit, by a foreign corporation and the most unscrupulous monopoly that ever existed. The only possibility of defeating the bill is in the large sums which the monopoly—or more properly speaking, conspiracy—known as the Standard Oil Company, can afford to spend in a corruption fund.

To appreciate this bill, which was before the Legislature last week and referred to a committee for consideration Thursday, it is essential to know something of the grievances which the oil country has suffered in years past and which this bill proposes to partially relieve.

The Standard Oil Company has been permitted to develop until it now wields absolute dominion over all the oil fields in the State. It not only regulates the prices of crude and refined oil, but also arbitrarily fixes the rates for heating, waste, transportation and storage. In its organization a number of refiners, never destined by honorable means to be more than locally conspicuous for either ability or capital, conspired to buy out, drive out and effectually crush all competition. This they did by bribing the Legislature to prevent competing pipe lines, combining with the Pennsylvania, Baltimore & Ohio, New York Central and Erie Railroads, subsidizing railroad officials and getting enormous discriminations. Not only did the Standard enjoy rebates on its own shipments, but also on those of its competitors, (correspondence of A. J. Cassatt and Daniel O'Day, 1878,) amounting, in one instance, according to Mr. Cassatt's testimony before the New York Legislative Investigating Committee, to \$10,000 in eighteen months. Besides these rebates the railroads charged as much for shipping the oil of the independent refineries at Pittsburgh and vicinity to the seaboard as from the Standard works at Cleveland. In 1874 the railroad rates to New York were \$1.90 a barrel, regardless of distance. To give an idea of this excessive charge: The independent refiners, after the Columbia Conduit Company completed its pipe line to Pittsburgh, shipped their oil down the river to Huntingdon, W. Va., and thence by the Chesapeake & Ohio Railroad to Richmond for exportation.

Besides the Standard squandered millions of dollars in buying and wrecking refineries, paying as high as \$50,000 a year to small refining concerns to remain in idleness, and giving large salaries to men of experience for burying their talents and depriving the oil country of their usefulness. Up and down our valleys and along our railroads the hand of the great destroyer has converted prosperous refineries into haunts for bats and owls. The oil country has no rights which the monopoly was bound to respect, and none which our Legislature would protect. Year after year the oil people have been denied justice, the common right of man, while their property was being confiscated and all their values depreciated by the conspirators until they fortified every

hill and occupied every valley, making competition absolutely impracticable. Then a free pipe line bill was passed by a more independent Legislature than any which had preceded for more than a decade. The preceding Legislature, the Pennsylvania Railroad Company and the Standard Oil Company were the triumvirate which conspired to give the monopoly absolute control of the newest and one of the greatest industries of the State. The history of civilization affords no such example of the financial oppression of the many for the enrichment of the few. While others compete for trade the Standard dictates what it will give, demands what it will take and now has power to say to the rising oil tide like God said to the ocean: "Thus far shalt thou come and no farther shalt thou go." But no one can tell when its imperial majesty will command it to ebb or flow.

Perhaps it may be thought that this monopoly of the oil trade, like most other great successes, is largely due to industry, sagacity and foresight. In the New York Investigating Committee's report, page 44, are the words, "That these gentlemen possess eminent business talent is obvious, but that they possess a monopoly of the business talent of the country commensurate with their monopoly of the oil business is eminently absurd." There yet remain many men in the oil business who could successfully compete with them in any open field of production, manufacture, commerce or trade. An independent refiner, who has been intimately associated with some of the Standard principals, claims that they are below mediocrity in ability, and that, while others have to seek and push business, they simply sit in their office and dictate terms. In fact, freebooters, pirates and conspirators have never been regarded as possessing the highest order of business ability or intellectual and moral qualities. Yet the Standard Oil Company has obtained such power as to say to Vanderbilt "Go," and he goes, and Gould "Come," and he comes, and to the Pennsylvania Legislature "Do this," and, with one exception, it has heretofore done it.

Some have said that the bill should be so framed as not to do injustice to the Standard. The Legislature of this State has not the power to do injustice to this monopoly. Even if it could confiscate its hoarded millions for the benefit of its victims they would still be short millions more levied upon their industry for bribery and devastation. While the Standard has committed the greatest commercial crime of the age it has prevented more good than it has accomplished evil. If oil could have been marketed through the regular channels of transportation and manufacture, which have been enjoyed by other industries,

THRIFT AND WEALTH

would have been scattered through towns and cities in the western part of the State, and the legitimate result of competition would have been a larger consumption of oil by all the nations of the world. The monopoly with its accumulated millions has not the incentive of competition to seek additional consumers, but would rather wait in luxury and let the consumers seek it. The 30,000, 00 of barrels now in stock, held as a rod over the trade, would long ere this have been consumed if the trade had been free or the monopolists had used one-tenth of their corruption fund to market the product in a legitimate way.

Having thus attempted to call attention to the despotism which has been permitted to dominate a large section of this Commonwealth, I would now consider some of the main features of the bill, which only attempts to

provide against the continued enforcement of a limited portion of the great evil from which the oil country has suffered for the past fifteen years.

Twenty cents a barrel was established many years ago as a reasonable price for piping oil to loading racks in the oil districts. This was at a time when oil was selling at from \$3 to \$7 a barrel, and gold was at a premium. Since then all values have settled, and trade has assumed a normal condition. At that time the pipe lines received, in round numbers, about 4 per cent. of the value of oil for piping it. To-day they are receiving about 40 per cent. for the same service. This, too, when improved and cheaper facilities have reduced the expense of handling the same number of barrels—presumably more than 50 per cent.; but the extortionate price remains the same yesterday, to-day, and no doubt would forever, unless regulated by a superior power, if any such yet remains. There need be no apprehension of preventing competition with the Standard by reducing the price of piping to 10 cents a barrel from the wells to the railroad racks or seaboard pipe lines, as abundance of capital would at once seek such an investment, if the outlets were not controlled by the Standard and there were refineries which could not be crushed or bribed.

Besides the charge for piping, the Standard pipe line, the National Transit, requires 3 per cent. for waste and an additional per cent., often amounting to more than 3 per cent., for heating the oil, and requires the producer to furnish steam for pumping the oil, worth more than one cent. a barrel, all of which rates are arbitrarily dictated and despotically enforced. This, at the present market quotations, makes the pipe line charges for delivering oil to the railroad racks and main pipe line stations, generally not more than from one to ten miles distant, 40 per cent. of its entire value. On the same principle, as well might merchants obtain by conspiracy a monopoly of all the wagons in the State and then say to the farmers, "We require you to haul to market your grain on our wagons, and we demand 40 per cent. of the value for shrinkage and the use of the vehicles."

THE COST OF STORAGE

is also most unjust, absorbing, as a rule, the entire value of the oil in about five years. To illustrate this, if the 30,000,000 of barrels of oil now in tanks, which have been held, say, on an average, ten years, were destroyed and all were held by the speculative trade, the Standard could pay the holders of certificates their market value and have over \$20,000,000 left for the investment. These exorbitant carrying rates have almost destroyed investments in oil. Purchasers, however, have been slow to learn that if they buy oil at 65c and pay storage and interest on the money invested, they must make about 25 per cent. per annum to come out even. This is practically leaving the price of oil in the hands of the Standard.

In addition to the reductions proposed by this bill, in my judgment, it should be so amended as to require an issue of separate certificates for oil in each district, and to prohibit the mixing of good oil with old and inferior grades without specification on the certificates. The buyer of oil should have the same right to know its kind and quality as the purchaser of any other commodity.

The greatest commercial despotism of all history has been permitted to grow in less than twenty years in the freest government known in the annals of time, and yet no Governor of the State of its denomination has called attention to its despotic power by general or special message, and it remains to be seen whether this Legisla-

ture will do something to relieve the oil people from their long suffering and oppression at the hands of the monopoly, which has two United States Senators, a member of the Cabinet, is reputed to own one State Legislature and dominate two others. Under its iron rule only those who are exceptionally fortunate in procuring very productive lands on which to drill are at all successful, while a great majority of the oil producers are financially sinking day by day and year by year. To further show the millions of dollars lost for want of competition I have but to instance the introduction of the Pittsburgh Pipe Line into the Butler field some eighteen months ago, when the Standard immediately put a premium of 12½ cents per barrel on all lower country oil. The same history has since been repeated in the Tarkill and Clarendon oil fields. Before this for years the Standard took no consideration of the relative values of upper and lower country oil. It has never hesitated "to reap where it has not sown, and gather where it has not strown." If the oil producers had been an independent State and the Standard a foreign power, they long ere this would have been dead or free. This monopoly has lived without conscience and it will die without mercy, as the time is fast approaching when such corporations will be wiped out in anarchy if not by law.

THOMAS W. PHILLIPS.

NEW CASTLE, February 14.

—Pittsburgh Dispatch.

The Average Price of Crude.

The following table gives the average price of crude certificates, on the floor of the Bradford Oil Exchange, since March 1, 1879:

MONTH.	1879	1880	1881	1882	1883	1884	1885	1886	1887
January	110 1-5	95	83	92½	111½	70½	88½	71	
February	103½	89½	85½	101	104½	73½	80	63½	
March	86	89	82½	80½	97½	100½	80½	77½	63½
April	78½	76½	84½	78½	92½	94	78½	74	-----
May	73½	80½	81½	70	99½	85½	79½	69½	-----
June	68½	100½	81	54½	117½	68½	82½	67	-----
July	69½	101½	76½	57½	108	63½	96½	66	-----
August	67½	90½	78½	58½	108½	81 1-5	100½	62	-----
September	69½	95½	92½	71½	112½	78	100½	63½	-----
October	88½	96½	92½	93½	111½	71	105½	65½	-----
November	105½	91½	82½	114½	114 4-5	72½	104½	72	-----
December	113½	92½	83½	95½	114½	74½	89½	71	-----

Recent Publications.

A PRACTICAL TREATISE ON PETROLEUM, by Benjamin J. Crew. Published by Henry Carey Baird & Co., Philadelphia. One volume, 508 pages. Price, \$4.50.

This new work on petroleum and its products is a welcome addition to the literature of the subject. Written by a practical refiner it is all that its name implies. Mr. Crew died just as his manuscript was about ready for the press, but the work has been well rounded out and completed by able hands. The results of recent investigations into the origin of petroleum, and of the latest geological researches, are carefully summed up. The work is particularly complete on all that pertains to the technology of petroleum. The chemistry of the subject, the methods of refining, and the various processes pertaining to the manufacture of the varied products, are all treated in a concise and practical manner. Recent developments in natural gas, with analyses of different gasses, its application for fuel purposes, together with comparisons of its value with other fuels, also find a place in this volume. Two plates and seventy engravings thoroughly illustrate the work. A full table of contents will be found in our advertising columns.

THE Findlay (Ohio) Gas Light Company is now supplying stoves with natural gas fuel at 15 cents per month.

FIELD OPERATIONS SUMMARIZED.

WELLS COMPLETED, WITH THE ESTIMATED PRODUCTION ON THE LAST DAY OF THE MONTH.

ALLEGANY FIELD.

Division of Field.	MARCH, 1887.			FEBRUARY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Scio.....	1	4	0	0	0	0
Alma.....	0	0	0	0	0	0
Wirt.....	1	0	1	2	5	1
Bolivar.....	0	0	0	0	0	0
Clarksville.....	5	25	0	3	14	1
Genesee.....	0	0	0	0	0	0
Miscellaneous.....	1	0	1	1	0	1
Total.....	8	29	2	6	19	3

BRADFORD FIELD.

Division of Field.	MARCH, 1887.			FEBRUARY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
E. and W. Branches.....	4	18	1	4	17	1
Kendall Creek.....	0	0	0	0	0	0
Foster Brook.....	1	10	0	2	18	0
Knapp's Creek.....	0	0	0	3	15	0
Four Mile.....	0	0	0	0	0	0
Indian & Meeks Creeks.....	1	5	0	3	21	0
Cole Creek.....	1	20	0	0	0	0
Kinzua.....	1	10	0	1	8	0
Miscellaneous.....	1	0	1	0	0	0
Total.....	9	63	2	13	79	1

WARREN AND FOREST.

District.	MARCH, 1887.			FEBRUARY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Glade.....	4	150	1	5	564	1
Clarendon.....	6	24	1	10	51	0
Tiona.....	8	42	0	4	20	0
Cooper.....	0	0	0	1	10	0
Balltown.....	2	15	0	1	10	0
Kane.....	1	5	0	6	65	0
Grand Valley.....	5	30	1	8	49	2
Miscellaneous.....	6	15	4	2	4	1
Total.....	32	231	7	37	773	4

LOWER COUNTRY.

District.	MARCH, 1887.			FEBRUARY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Venango.....	27	90	16	23	111	4
Clarion.....	10	85	3	8	36	2
Butler and Armstrong.....	29	1162	9	33	5123	4
Washington.....	10	1152	1	20	1645	4
Shoustown, Etc.....	8	925	4	7	275	2
Total.....	84	3414	33	91	7190	16

GRAND SUMMARY.

District.	MARCH, 1887.			FEBRUARY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Allegany.....	8	29	2	6	19	3
Bradford.....	9	63	2	13	79	1
Warren and Forest.....	32	281	7	37	773	4
Lower Field.....	84	3414	33	91	7190	16
Total March.....	133	3787	44	147	8061	24
Total February.....	147	8061	24			
Difference.....	14	4274	20			

Rigs Up and Building—Wells Drilling.

ALLEGANY FIELD.

Division of Field.	MARCH 31, 1887.				FEB. 28, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Scio.....	0	4	0	4	0	0	1	5
Alma.....	0	5	1	6	0	5	1	6
Wirt.....	0	9	2	11	1	9	0	11
Bolivar.....	0	0	0	0	0	0	0	0
Genesee.....	0	8	0	8	0	8	0	8
Clarksville.....	1	5	0	6	4	4	2	10
Miscellaneous.....	0	0	0	0	0	0	1	1
Total.....	1	33	3	37	5	32	6	43

BRADFORD FIELD.

Division of Field.	MARCH 31, 1887.				FEB. 28, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
E. and W. Branches.....	2	9	3	14	2	9	4	16
Kendall Creek.....	0	0	0	0	0	0	0	0
Knapp's Creek.....	1	6	2	9	1	8	0	9
Foster Brook.....	1	4	0	6	0	4	1	5
Four Mile.....	0	3	0	3	0	3	0	3
Indian Creek.....	1	2	3	6	1	5	1	7
Cole Creek.....	1	5	1	7	2	4	2	8
Kinzua.....	1	1	3	5	0	0	0	0
Miscellaneous.....	0	0	0	0	0	0	0	0
Total.....	8	30	12	50	9	33	9	51

WARREN AND FOREST.

Division of Field.	MARCH 31, 1887.				FEB. 28, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Glade.....	3	0	5	8	4	0	3	7
Clarendon.....	3	6	6	15	3	4	6	16
Tiona.....	1	1	3	5	3	0	0	10
Cooper.....	0	2	0	2	0	0	0	2
Balltown.....	0	2	2	4	0	0	2	4
Kane.....	0	4	2	6	0	0	2	6
Grand Valley.....	8	3	9	20	3	4	4	9
Miscellaneous.....	3	4	12	19	3	4	9	16
Total.....	18	22	39	79	20	20	30	70

LOWER COUNTRY.

Division of Field.	MARCH 31, 1887.				FEB. 28, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Venango.....	22	13	24	59	13	13	27	53
Clarion.....	9	7	7	23	8	8	9	20
Butler & Armstrong.....	11	6	29	46	9	4	33	46
Washington.....	7	7	36	50	8	8	33	43
Shoustown, Etc.....	4	4	13	21	2	2	20	27
Total.....	53	37	109	199	32	35	127	194

GRAND SUMMARY.

Field.	MARCH 31, 1887.				FEB. 28, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Allegany.....	1	33	3	37	5	32	6	48
Bradford.....	8	30	12	50	9	33	9	51
Warren and Forest.....	18	22	39	79	20	20	30	70
Lower Country.....	53	37	109	199	32	35	127	194
Total.....	80	122	163	365	66	120	172	358
Total Feb. 28.....	66	120	172	358				
Difference.....	14	2	9	7				

THE Voorwarts, a new steel steamship built specially for carrying oil in tanks, is a sister ship of the Gluckauf, which engaged in the oil trade a year ago, but is now running between Bremen and Black Sea ports. Captain Fortmann, who was master of the Gluckauf, now commands the Voorwarts. The new steamship measures 1508 tons. She was built in the yard of Armstrong, Mitchell & Co., at Newcastle-on-the-Tyne. Her hold contains sixteen water tight compartments, of which the majority are tanks. Several of these can be used for water ballast. The dimensions of the steamship are: Length 300 feet, breadth of beam 37 feet and depth of hold 24 feet. She has triple compound engines. Her rig is that of a three-masted schooner. She is owned by parties in Germany, and employed in transporting oil to Bremen on owner's account.

THE Toledo Natural Gas Company is pushing its arrangements for laying its pipe line from the Ohio gas fields to Toledo, Ohio. L. H. Smith, president of the Anchor Oil Company; W. J. Young, vice-president and general manager of the Forest Oil Company; T. J. Vandergrift, F. M. Aiken, J. I. Buchanan, John A. Lambing and a number of prominent Ohio capitalists, are largely interested.

THE Selma Oil Company has been organized at Selma, Alabama, with a capital stock of \$50,000, with George O. Baker as president, Owen O. Nelson, of Montgomery, vice-president, and Joseph M. Baker, secretary and treasurer.

ACCORDING to the gauges taken by Mr. B. S. Tupper and his associates, the Washington production averaged about 7250 barrels a day in March.

THE PETROLEUM AGE,

DEVOTED TO THE
INTERESTS OF THE PETROLEUM TRADE.

PUBLISHED MONTHLY BY
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NATURAL GAS IN EASTERN KANSAS.

FROM FIFTH BIENNIAL REPORT OF THE KANSAS STATE
BOARD OF AGRICULTURE.

BY ROBERT HAY, U. S. G. S.

IN this gas question, as in others, Kansas is the central State. The geology of her eastern borders touches that of Ohio and Pennsylvania. Her western limits include shales and sandstones that ally her to the oil and gas deposits of Wyoming. Her western counties may yet find in natural gas a native fuel.*

Eastern Kansas is already using natural gas. The history of its development in that region is similar to the history in other places. Gas has been found in prospects for oil, and has been developed from surface indications—actual escapes from the soil or rocks—which has been known for long periods. Professor Mudge, in his report for 1864, states that petroleum, both as oil and bitumen, is found all down the eastern tier of counties, from Atchison to Cherokee. He also saw it in Riley county. Prof. Swallow, in his report for 1865, gives the names of four "tar springs," and says he saw fifteen others in Miami county. For the existence of oil in quantity in Miami county, he sums up the evidence thus: "The facts that scarcely a well has been dug without finding petroleum in some of its forms, that four sandstones are in many places perfectly saturated with it, that more or less of it is found in the cavities of other rocks, and above all that it has been flowing from some score of springs from time immemorial, are, to say the least, very strong evidence of the existence of large reservoirs in these localities." Prof. Swallow is unfortunately wrong in regarding the springs as evidence of reservoirs. They are the best of evidence that there is no reservoir. These springs are at the outcrop of the oil-bearing rocks, and tell us that nature has poured out the oil about as fast as it has been made in those rocks which are cut into by the drainage of the district. Still, oil may be there at depths not yet reached by the drill; and with the oil there is certain to be more or less gas.

On Mr. Westfall's farm, in sec. 16, township 17, r. 24, 7½ miles east of Paola, is a "tar spring," and close by a well which pierces the source of the tar or oil, a sandstone saturated with petroleum. Owing to this, borings have been made here, and further east and west, for over twenty years, for oil. A boring of 300 feet on the banks of the Wea, one mile from Paola, was made in 1874. The St. Louis or Ernstein Oil Company bored two wells ten miles east of Paola in 1865, and lost their tools at a depth of 700 feet. These borings showed some gas. Some borings at Osawatomie in 1865-6 gave brine and

some oil. In 1882 a well was bored on the Westfall place, which gave gas in considerable quantity. The driller, Mr. Warner, then formed the Kansas Oil and Mining Company, under an old lease. This has been changed to the Paola Gas Company, of which B. Miller is now the president. This company have a capital of of \$25,000. They have bored some wells about town, but three wells on the Westfall place are the sources from which they are now supplying gas as an illuminant and fuel to the town of Paola, over seven miles distant. There are four wells, but one yields no gas. Tested by a steam gauge, the gas had the following pressures:

Well No. 1, 66 pounds to the square inch.

Well No. 2, 66 pounds to the square inch.

Well No. 3, none.

Well No. 4, 55 pounds to the square inch.

Another well, nearer town, (Boone's,) gave a pressure of 40 pounds. These pressures, it will be seen, are very much below those recorded for the great wells of Pennsylvania and Ohio; but it is a very useful pressure, and the wells yielding it are capable of supplying a vast amount of fuel and light. The heating qualities of this gas are very great, but as an illuminant so far it is not quite as good as the better kinds of artificial gas.* Another company (the Wea Coal, Oil and Gas Company) is now engaged in drilling near Paola; and one of the members of it (Mr. W. G. Oakman) owns a well at Beavertown, five miles east of Paola, which yields considerable gas at a depth of only 76 feet. The depths at which gas is obtained in the wells on the Westfall place are:

Well No. 1, 304 feet to top of "gas sand."

Well No. 2, 300 feet to top of "gas sand."

Well No. 3, 288 feet to top of "gas sand."

No. 1 penetrated the "sand" 10 feet. No. 2 went through it (35 feet) and went farther, to a total depth of 442 feet, without finding more gas. No. 3 found the gas sand intercalated in thin strata with "slate," and the gas in very small quantity. The wells are all on the same quarter section, and are at approximately the same level. In No. 1 the well is cased to a depth of 200 feet, and in No. 2 to a depth of 235 feet. No. 2 has a good supply of brine, which it is intended to utilize in the manufacture of salt. Nos. 1, 2 and 4 are almost in a straight line—the distance from 1 to 2 being 1300 feet west by south, and No. 4 100 feet from 2, in the direction of 1. An examination of the drill records of these wells shows considerable differences in the strata, after allowing for possible errors.

At the small town of Louisburg, in Miami county, a gas well supplies gas from a depth of three hundred and twenty-five feet to light and heat a small hotel.

Fort Scott, in Bourbon county, has this year begun the use of natural gas, and has "struck oil" in a well yielding four barrels per day. Southwest of that town, on the banks of the Marmaton river, gas has been escaping for at least a quarter of a century. The Fort Scott Economy Fuel Company, of which Major Knapp is the energetic superintendent, has leased land from the proprietor, Mr. Stuart, and has drilled four wells, three of which are yielding an abundant supply of gas. The three productive wells form the apices of a triangle nearly equilateral, whose sides are just under 700 feet in length. The distance from town is little, as the farm abuts on the city boundaries. Mains have been laid, and the gas is now in use in Fort Scott hotels, private

* Gas has been given off in wells both in Washington and Mitchell counties.

* The gas is used in Paola for heating steam boilers, bakers' ovens, cook stoves and for illumination in the stores of the city.

houses, car barns, etc. In these wells a gas horizon is found at about 100 feet below the first limestone, which shows itself in the bed of the Marmaton; but the main supply is from a bed of sandstone, which is reached in the different wells at from 175 to 195 feet below the limestone horizon mentioned. In well No. 3, only gas of the upper "sand" was obtained, and that in small quantity. In well No. 4, the gas of the upper sand is much greater in quantity, and the main gas is also stronger. The lower gas sand in well No. 1 was passed entirely through, showing a thickness of 42 feet, and below it 40 feet of shales and "black slate," with three seams of coal were found. The artesian well at Fort Scott—621 feet deep—yields considerable gas with sulphurous odor, and the record shows a sandstone at about the same depth as in the other wells. The record of a well on the Plaza Point, in the city, shows an oil bearing sandstone some 80 feet lower. A deep boring—the Brickley well, two miles east by south from the Stuart wells—shows a sandstone in about the same position, but divided into parts by an intercalation of shale. The record makes no mention of oil or gas. A shallow well (110 feet) in the eastern part of the city, is blowing off gas bubbling with water; this from a much higher horizon than the gas wells proper. Five miles west of Fort Scott, on the north side of the Marmaton, the striking of gas in a school well caused the driller to abandon his work at about 75 feet of depth. The oil well record, just east of the city, shows a sand about the same as the gas wells, but the oil is obtained at a depth of 400 feet.

At Wyandotte, or in what is now Kansas City, Kansas, there are three wells of which the gas is being utilized—one at a flour mill, one at a planing mill and one at the pressed brick works. At the two former the gas is turned into the furnace under the steam boiler, and is estimated to save from 10 to 20 per cent. of the coal. At the brick works it is used in the same way, and saves 90 per cent. of the coal. Another well at Wyandotte is blowing off gas and some oil, which are not utilized at all. The drill records of these wells appear to be lost.

Two miles east and half a mile south from LaCygne, in Linn county, on the east bank of Middle creek, gas has exuded from the ground for generations. Indian pow-wows were held around its flame. The land has been leased by Mr. McCarthy, of LaCygne, and a well 180 feet deep has been drilled, from which gas is obtained, sending a flame twenty feet high. Concessions have been obtained from the city of LaCygne, but want of capital has so far hindered the use of this gas, and tens of thousands of cubic feet are daily wasted in the air. At Mound City, in the same county, a gas well 125 feet deep has been in existence since 1881. The brine from it is drunk as a mineral water but the gas is not utilized. Another well is now being drilled for the purpose of obtaining gas. Drilling has also been done at Pleasanton.

The well-known mineral well at Iola, in Allen county, yields gas from a crevice in black shale just below an oil bearing limestone, at a depth of 628 feet. For some time this was used in a heating stove in the hotel, but the floods of last year came over the top of the well and diminished the supply, and the small quantity now issuing is allowed to escape unused. Another well is being drilled now, prospecting for gas at Iola. Four and a half miles north and one mile west of Moran, in the same county, is a well yielding gas at a depth of 103 feet. It is not utilized.

In Crawford county gas has been obtained in the deep well owned by the city of Girard, but it has not been put to any use. A well over 400 feet deep at Mound Valley, Labette county, is giving out considerable quantities of gas. Its force is sufficient to hold the column of salt water up to the surface, where it flows like an artesian well. Owing to doubts about the title, this is being allowed to run to waste.

The mineral well, 1000 feet deep, at Independence, in Montgomery county, yielded gas from a black shale, at a depth of 425 feet. A boring at Liberty, in the same county, made this year, yielded large quantities of gas at a depth of 100 feet. The boring was for coal. Now a shaft has taken the place of the drill hole, and gas is constantly escaping. It has a strong odor, as of coal gas. All other gases in Kansas are odorless, or nearly so. In July last an explosion, seriously hurting two men, was occasioned by a miner lighting his pipe down the shaft.

Gas in small quantities has been noticed elsewhere, and oil has similarly been found as far west as Manhattan, and many towns are now prospecting for gas and oil. Ottawa is about to begin, and a company has been formed for the purpose at Wichita and at Quenemo.

Over the border, in Missouri, oil and tar springs and wells have long been known. There is a gas well, not utilized, in Vernon county, fourteen miles east of northeast from Fort Scott, and six miles north of Deerfield, and in Kansas City there are several, some of which are utilized. One owned by Mr. Dietz is used for burning lime; another illuminates and warms the barns and house of Dr. Ridge; a third, 400 feet deep, is at the residence of Mr. Tobener, McKee street. The salt well at the natatorium has gas, but it is unused.

During the past summer the writer has visited thirteen places where there is natural gas, and seen twenty wells yielding it in Kansas, besides seeing it issue from the ground in three other places. Of most of these wells he has obtained the drill record, and has visited also several of the occurrences of gas in Missouri. Examining also with some degree of minuteness the geology of some of the localities, he is prepared to state with some definiteness the geological facts with regard to natural gas in Kansas. The chemistry of it will be dealt with by Prof. Failyer, who has examined carefully the samples of gas sent to him.

The gas at Fort Scott, Paola and LaCygne is obtained in sandstone. These are the largest supplies. The gas at Mound Valley, at depths of 203 and 447 feet, is from black shale. The gas at Iola is from a twenty-inch crevice, that may be in limestone or sandstone with black shale above and below.

These "gas sands" are all of carboniferous age, and belong to the lower coal measures. In Vernon county, Missouri, around the county seat, Nevada, the traveler may see a deposit of sandstone from 30 to 50 and 60 feet thick, which stretches far to the south and southwest as well as north. Prof. Broadhead has called this the Clear creek sandstone. In many places it is saturated with oil, manifest both to sight and smell. Dipping westward, about the longitude of the confluence of Marmaton and Drywood, it disappears under a covering of shale, and in it, thus covered, is the gas well north of Deerfield before referred to. Dipping still westward, we believe this is the lower (main) "gas sand" of Fort Scott.

The identification of the gas rock of the other places mentioned with rocks of known outcrop will need further investigation, but the tendency of the facts so far

known is to suggest that the Paola gas is also from the same horizon

Four wells—not the gas wells—at Fort Scott, all pass entirely through the carboniferous formations and enter the sub-carboniferous cherts and limestones. These are:

The artesian well, 621 feet deep.

The Brickley well, 996 feet deep.

The Walburn oil well, 450 feet deep.

The Point (Plaza) well, 461 feet deep.

It would appear, then, that the lower "oil sand" of the oil well (for there are two, and possibly the upper one also) is in the sub-carboniferous formations. This fact gives encouragement to try for oil and gas also, at greater depths than have yet been prospected. That the other deep wells have not yielded oil, is partly to be accounted for in the fact that oil was not sought. It is a fact that in Pennsylvania, wells yielding no oil when the drill was withdrawn have become profitable by a judicious use of the pump. It may be that the Brickley well has penetrated through the sub-carboniferous and is within a short distance of Devonian shales, or in their absence, Silurian deposits of oil or gas.*

The great fact of the proper structure is not yet very plain in Kansas. No great anticlines or synclines are known to our geologists, but that there is change of dip in the lower coal measures is well known. The average dip of the strata in the eastern counties is probably not more than ten or twelve feet to the mile, but a comparison of the strata passed through at the Manchester coal shaft, LaCygne, and the gas well east of that town, shows a descent of eighty feet in a little over two miles, or something more than three times the average dip. The well being up that incline, is well situated for gas, and yields continuously.

About Fort Scott it is certain that there is considerable change of dip; but it will require more study of the available material, and the making of some additional observations, before the exact position of the gas wells as to geological structure can be determined. While we write, comes information that another well, across the Marmaton from the others, is yielding gas in large quantities.

A notable feature of the position of gas wells in Eastern Kansas, is their relation to the topography. They are all in valleys. At Fort Scott and Wyandotte they are in the main valley of the region. At LaCygne, Paola and Mound Valley they are in important tributary dales. Nearly twenty years ago the writer made the observation in a limited region of the Lancashire coal field in England, that the brooks of the district were on the line of faults. The district was greatly faulted, but the faults largely hidden by glacial drift. Fifteen years' observation in Kansas leads to a generalization similar in kind, which may be stated thus: "The original drainage of the country is distinctly related to geological structure." However evenly the surface emerged from the sea, in which its last strata had been laid down, there would be some inequality, some undulations of surface, and towards the lowest parts the drainage would at once commence. By original drainage in Eastern Kansas, we mean the valleys of those streams which were cut before the glacial period, as at that time this drainage system was largely choked up and diverted. The old beds are now largely restored, and can be examined in reference to the structure of the strata

in which they were cut. Such examination as we have been enabled to make, leads us provisionally toward the opinion that the principal gas wells, if not at the bottom of slopes or small synclines, are located at some distance down such slopes. It would appear that this is so from the fact that no well has yet yielded dry gas, but on the contrary, there is much salt water. It would seem, then, that when more extensive examination is made, wells may be located near the top of a monocline slope or local anticline, and give larger supplies than have yet been obtained in Kansas, and at a greater pressure. If attempts are made to reach, by deep wells, the sub-carboniferous, Devonian or Silurian strata, the chances for finding proper structure are probably greater, as it is well known to geologists that in our extreme southeast, and in Missouri, the lower coal measures lie erosively unconformable over the sub-carboniferous cherts and limestones.

Crude Market for March.

The petroleum market afforded nothing of interest the past month. The same stagnation and general dullness that has characterized it for several months continues, but the field situation shows considerable improvement. The Reibold pool, in Butler county, proved of slight importance, while the new Taylorstown section of the Washington field has as yet developed little that appears dangerous. But the market has ceased for the time being to reflect the field position. All buyers seem to have been driven out of the business, and the petroleum certificate has few friends. It has been the policy of the power in control, apparently to cripple all speculation, and producers and others, who pinned their belief upon a coming boom in petroleum circles, have been grievously disappointed. The unsettled condition of affairs, in regard to the Billingsley bill, and the postponement of this important measure, has had some influence in keeping the market in an expectant condition.

The month commenced with the market at 61¼c and 61⅝c. The lowest point 61⅜c, was reached on the 8th, and the highest 65⅜c on the 17th. It closed very quietly at 63¼c and 63½c. The highest price for February was 69½c, and the lowest 59⅞c.

The range of prices for March was 4c as compared with 9¾c in February, 4¾c in January, 16⅜c in December, 14⅝c in November, 4¾c in October, 4¾c in September, 6½c in August, 3⅞c in July, 8¾c in June and 12⅝c in May. The average price on the floor of the Bradford Exchange was 63¼c in March, 63⅜c in February, 71c in January, 71c in December, 72c in November, 65½c in October, 63⅜c in September, 62c in August, 66c in July, 67c in June, 69⅞c in May and 74c in April. The average price for March one year ago was 77½c.

Business at the Exchanges has ruled very light, as shown by the small volume of clearances. The largest single month's clearances ever recorded, was that of the New York Exchange in October, 1885, when the clearances amounted to 422,586,000 barrels.

THE CLEARANCES.

	March. Barrels.	February. Barrels.
Bradford Oil Exchange	21,446,000	27,940,000
Oil City	33,460,000	50,172,000
New York Consolidated Exchange.....	97,743,000	124,433,000
Pittsburgh Petroleum Exchange, est.....	42,718,000	59,943,000
Philadelphia Oil Exchange, est.....	9,905,000	18,000,000
Total	205,272,000	280,493,000

THE Washington field on April 16th made 7978 barrels from 172 producing wells.

* Judging from the sections of wells at Pittsburgh and Girard, in Crawford county, as given by Prof. St. John in the biennial report of two years ago, we opine that the Devonian formations are missing here.

THE PRODUCING REGION.

At the beginning of March there were 66 new rigs and 172 drilling wells in the New York and Pennsylvania oil region, a total of 238. The number of wells completed in March was 133, with an estimated new production of 3787 barrels. The dry holes numbered 44, leaving 89 productive wells with an average yield of $42\frac{1}{2}$ barrels. During February the entire region completed 123 productive wells and 24 dry holes, and the average of the new wells was $65\frac{1}{2}$ barrels. The average of the January wells was 30 barrels each, of the December 30, of the November 31, of the October 30, of the September 62 and of the August 48 barrels. The March figures show a decrease of 14 wells and of 4274 barrels new production, while February recorded a decrease of 12 wells and an increase of 4354 barrels in the new production. At the close of March there were 80 new rigs, 122 old rigs and 163 drilling wells in the entire region, a total of 365, as compared with 66 new rigs, 120 old rigs and 172 drilling wells, a total of 358 at the close of February. This is an increase of 14 new rigs and of 2 old rigs, with a decrease of 9 drilling wells from the figures of February 28th. February had a decrease of 40 in active operations from the January report, while January showed a decrease of 48 from December and December of 95 from the November figures. At the close of March, 1886, the record showed 263 new rigs, 122 old rigs and 413 drilling wells, a total of 798.

ALLEGANY FIELD.

Eight wells were completed in the Allegany district in March, including 2 dry holes. One of these, the Willets duster, in Birdsall township, was outside and remote from the defined limits of the field. The new wells averaged about 5 barrels each. The Allentown Oil Company's (L. G. Norton) experimental well, on lot 46, Scio, had a good showing of oil and is rated among the 4 barrel producers. The Empire Gas Company found another gas well on lot 50, Wirt. At the close of the month new work in the Allegany field consisted of 1 rig and 3 drilling wells, the lowest figures recorded in the history of the field. The work of abandoning old wells still goes on, and would be much greater than it is were there a greater demand for second-hand oil well supplies.

THE BRADFORD FIELD.

Nine completed wells is Bradford's record for the month of March, and two of these were dry. The Manufacturers' Gas Company's third experiment, on the Mack lands, up the West Branch, was a failure. Stevens Bros' well, on the Woodmansee farm, near Allegany village, Cattaraugus county, is likewise numbered among the dusters. The production of the new wells averages 9 barrels. The February report showed 13 wells completed and 79 barrels new production. At the close of the month there were 8 new rigs and 12 drilling wells in this district, as compared with 9 new rigs and 9 drilling wells at the close of February.

WARREN AND FOREST.

There were 32 wells completed in the Middle field in March, including 7 which were dry, and the new production was 281 barrels. This is a decrease of 5 wells and of 492 barrels production, as compared with the figures for February. On the last day of March the field showed 18 new rigs, 22 old rigs and 39 drilling wells, against 20 new rigs, 20 old rigs and 30 drilling wells on the last day of February.

KINZUA VILLAGE.—The development west of the river at Kinzua Village is pushing out slowly toward the

west. Morse, Collins & Heasley's well, on the Hodge farm, started at 50 barrels an hour. The wells are flashy and do not hold up at a large rate for any great length of time. Smith, Bright & Co.'s No. 8 proved an ordinary producer. The venture of Sill, O'Dell & Barnsdall, near the northwest corner of 5564, was a duster.

Clarendon and Tiona are more than usually dull and uninteresting. Nothing at all is being done in the Cooper district. Horton, Crary & Kraeer completed a very small well on lot 741, northeast of Balltown, while J. C. Welsh found a fair producer on his sucker-rod extension of the pool, to the southwest. Clark & Foster's venture, on lot 554, in Cherry Grove township, is reported a failure.

KANE.—But one well was completed in the Kane district during March, and at the end of the month but two drilling wells are under way. The old wells, on account of their great depth and the peculiar character of the sand, require a great deal of attention to keep them in producing order.

GRAND VALLEY.—The Grand Valley field reveals increased activity. L. B. Wood & Co., Miller Bros. & Crippens, the National Oil Company and others, will drill over a large area of ten-barrel territory the coming summer. Efforts on the northern end of the field have not been rewarded with an abundant measure of success. The Reno Oil Company completed another duster on the David Ash farm, while McConnell & Co. were rewarded with a very small producer on the Upton farm. Boiles & Roberts found another of the same class on the Rhinehart farm, near Newton Station, which was shot April 8th. Operations are likewise on the increase in the vicinity of Pleasantville and Enterprise. This old territory, which was thought sufficiently tested years ago, is now in good demand, and although affording no very large wells, yields moderate but slow returns on small investments.

ELK COUNTY, ETC.—There were nine wells and two rigs under way in the Elk district, southwest of Kane, on the last day of March. The field has shown no indications as yet of any wells that can be considered fairly remunerative, but operators have strong hopes of finding something better. Clark & Foster's well, on 3672, Forest county, south of the Feeley producer, is dry. Porter, Thyng & Co.'s No. 2, on 2033, the only well completed in Elk county in March, is rated at 5 barrels. Young & Loucks found a nice, little well, near Shamburg, in Forest county, but the other ventures in Forest county were worthless. The second test of the Shannon, Kelley and others, on warrant 5504, showed considerable oil in the Clarion sand, but did not fill up enough to warrant a producing well and was abandoned. Mealey & Co. discovered a duster in Tionesta township, near the Clarion county line, and the second experiment of Taylor, Torrey & Murphy, in Hickory township, was likewise a failure.

THE LOWER COUNTRY.

There were 84 wells completed in the Lower Country in March, and 33 of them failed to find oil in paying quantities; the new production is rated at 3414 barrels. On the 31st of March the Lower Country had 53 new rigs, 37 old rigs and 109 drilling wells, as compared with 32 new rigs, 35 old rigs and 127 drilling wells on the 28th of February.

VENANGO.—Out of 27 wells completed in the Venango district in March 16 were failures as oil producers, and the productive wells averaged about 8 barrels each. There is a net increase of 6 in rigs and drilling wells over the February figures. The wild-catter is once more in

likely or promising wild-cat, and word was given out by them that it had an even chance for striking oil. According to the depth of the Pittsburgh coal the Gordon sand at this well should have been reached at 2320 feet. At the proper theoretical level no traces of sand or oil were found, and the well was a blank in the wild-cat lottery. The wells in the Taylorstown pool are holding their production for the small amount of sand rock which affords the oil. The gentlemen who waste their mental energy in figuring on theoretical belt lines have adopted the theory of a belt running in a north-westerly and southeasterly direction. The Forest Oil Company & Craig have started an important well on the Woodburne farm, a half mile north of the pioneer well on the McMannis farm.

Below is a list showing the production of wells by groups on the different farms which make up the total of the Washington field for March 12 and April 9, 1887:

Farm.	Operator.	Number of wells, April 9.	Production April 9, Bbls.	Number of wells, Mar. 12.	Production Mar. 12, Bbls.
Gordon, P. L. & H. Co.		4	94	4	179
Hess, "		3	20	3	18
Weirich, Forest Oil Co.		2	20	2	
Hall, "		4	30	4	743
Barre, "		12	686	11	
Taylor, Union Oil Co.		7	235	6	245
Morgan, "		6	198	5	115
Davis, "		7	650	6	840
Dye, "		1	35	1	50
Workman, "		2	300	--	--
McGovern, "		1	25	1	25
Clark, "		1	3	1	5
Gantz, Citizens' Oil & Gas Co.		1	28	1	28
Weaver, "		1	9	1	9
Clark, Hallam & Co.		1	8	1	6
Taylor, Galigan & Young		2	58	2	70
Zelt, Associated Producers Co.		1	3	1	3
Curry, "		1	15	1	15
Wiley, "		1	7	1	10
Martin, "		1	13	1	20
Clark, R. H. Thayer & Co.		6	202	6	153
Munce, John McKeown		10	450	9	
Martin, "		3	390	2	750
Quail, "		1	10	1	
Smith, Willets & Young & Chartiers O Co		5	104	5	82
Cameron, "		9	430	8	451
Wright, Chartiers O Co & F W Andrews.		3	152	3	344
Fergus, Chartiers Oil Co.		2	254	1	17
Stewart, Fisher Oil Co.		1	56	1	94
Lead Lot, Marsh & Caldwell.		1	35	1	35
" McKeever & Mulholland.		1	15	1	15
Fair Grounds, Wheeling Oil Co.		3	84	3	130
Cradle Factory Lot, Miller.		1	35	1	42
Hall Lot, Guley & Co.		1	5	1	5
Linn, Coast & Co.		3	79	3	96
Weirich, "		1	10	1	13
Hayes, "		1	10	1	7
Shirls, Shirls.		3	--	3	120
Manifold, Pew & Emerson.		2	62	2	66
Gabby, "		1	5	1	5
Martin, Central Oil Co.		3	149	2	150
McGahey, Mascot Oil Co.		4	166	4	443
Miller, (Bunghole well), Reid & Co.		1	--	1	--
Montgomery, McKinney & Co. & Robbins.		2	19	2	28
Thome, Chartiers Oil Co & F W Andrews.		1	5	1	8
Wade, B. B. Campbell.		1	40	1	70
Weaver, Hart Bros.		1	15	1	9
Thome, Lee & Shank.		2	76	2	135
Wiley, Munhall & Co.		2	6	2	12
McKean, Caldwell & Co.		1	20	1	24
Van Kirk, "		1	--	1	4
Whittlesee, "		1	98	1	150
Watson, Butler & Co.		2	20	2	35
Martin, Allen & Co.		1	20	1	10
Munce, I Willets & Son.		24	757	22	850
TAYLORSTOWN.					
McMannis, W Va Nat Gas Co.		1	55	1	60
Noble, "		1	200	1	220
Blayney, Hart Bros & Co.		1	175	1	175
Cundall, Vandergrift, Reed & Aiken.		1	147	1	168
Total		168	6791	155	7358
SHANNOPIN.					
Date.	No. of wells.	Production		Barrels.	
March 12, 1887.	155	7358		7358	
April 9, 1887.	163	6791		6791	
Difference.	15	567		567	

short distance southwest of the large wells on the Marks farm. No. 21 was finished about March 1st and started at 2000 barrels per day. Its gauge on the 6th of April showed that it was still producing 1000 barrels per day. Their No. 22, which produced over 650 barrels in twenty four hours, had declined to 90 barrels per day on the 6th of April. The Union Oil Company found a dry hole on the Thompson farm, in the Mount Nebo section. A small well was finished on the Thornburg farm, near Crafton Station, on the Pan-Handle Railroad. It found salt water below the level of the Gantz sand, which will make it expensive territory to operate. The drilling was exceedingly hard on account of the numerous sand formations encountered. The Forest Oil Company's well at Oakdale, in Allegheny county, was played as a mystery. It was learned, however, that volumes of salt water were discovered at a very expensive depth below the surface. The Philadelphia Company expect to open a field of some dimensions at the head of Montour run. They have one well in this locality producing 11 barrels per day.

Comparative Statement.		
STATISTICAL SUMMARY OF THE PETROLEUM SITUATION.		
	1887.	1886.
	March.	March.
Wells completed	133	296
New production	3,787	5,205
Dry holes	44	50
New rigs	80	263
Old rigs	122	122
Drilling wells	163	413
Total field operations	365	798
Average daily pipe line runs	63,915	61,558
Average daily shipments	71,899	66,120
Total stocks custody pipe lines	31,806,986	32,710,560
THE MARKET.		
Refined in New York	6 5/8	7 1/2
Opening price of crude for the month	61 1/2	78 3/4
Highest price of crude for the month	65 3/4	80 1/4
Lowest price of crude for the month	61 1/2	71
Closing price of crude for the month	63 1/4	72 1/4
Average price of crude for the month	63 1/4	77 1/4

Summary of Daily Pipe Line Runs for March and February, 1887.

The following table shows at a glance the pipe line runs for March and February and the increase or decrease from each section. The estimate for Baldridge is based upon the runs of the National Transit Company, which were 2575 barrels in March, and an approximate estimate of the Pittsburgh Pipe Line, which includes all the oil run from Butler county, under one head:

	March.	Feb.	Increase.	Decrease.
Allegheny	5,000	4,949	51	---
Bradford	22,780	22,680	100	---
Cherry Grove	190	248	---	58
Baltowa	650	639	11	---
Cooper	509	403	106	---
Baldridge, estimated	5,500	6,025	---	525
Kane	2,473	2,628	---	155
Tarkill	1,081	1,200	---	119
Tipperary	152	192	---	40
Red Valley	606	572	34	---
Pontius	1,950	2,057	---	107
Washington	6,322	6,318	4	---
Shannopin	3,229	2,045	1184	---
Smith's Ferry	9	12	---	3
Macksburg	1,100	1,018	82	---
Other fields	13,464	13,585	---	121
Total	65,015	64,571	1,572	1,128
Total January	64,571	---	1,128	---
Increase	444	---	444	---

In addition to the above the runs of the Buckeye Pipe Line from the Lima field averaged 9777 barrels a day in March and 7394 barrels a day in February.

THERE are six natural gas companies in the city of Pittsburgh, managing 110 wells and supplying the gas through 600 miles of pipe, of which 232 miles are situated in the city proper. The total area of pipe leading into the city is given as 1,346,608 square inches, and the total capacity of the lines is estimated at over 250,000,000 cubic feet.

WHITE SAND POOLS.

CHERRY GROVE, COOPER AND BALLTOWN PIPE LINE
RUNS TO MARCH 31, 1887.

	Ch'y Gr'Ve. Bbls.	Cooper. Bbls.	Balltown. Bbls.	Total. Bbls.	Daily Av'ge. Bbls.
Total 1882	2,345,400	29,864	2,700	2,377,964	9,706
Total 1883	755,512	1,095,558	776,244	2,627,314	7,198
Total 1884	264,942	1,004,849	877,506	2,077,297	5,691
Total 1885	135,809	340,924	348,098	824,831	2,260
1886.					
January	9,478	19,320	32,953	61,751	1,992
February	8,552	15,987	29,579	54,118	1,933
March	10,942	20,227	32,839	64,008	2,065
April	10,403	17,499	24,979	52,881	1,763
May	10,477	18,322	42,660	71,459	2,305
June	10,324	18,154	33,126	61,604	2,053
July	10,731	18,050	35,976	64,757	2,089
August	9,305	17,289	24,788	51,382	1,657
September	7,671	14,465	27,384	49,520	1,651
October	7,723	15,348	20,677	43,748	1,411
November	6,949	12,513	20,630	40,092	1,336
December	6,320	14,280	20,721	41,321	1,333
Total 1886	108,875	201,454	346,312	656,641	1,799
Tot'l Dec. 31, '86.	3,610,538	2,672,649	2,280,860	8,564,047	5,020
1887.					
January	6,072	14,185	16,296	36,553	1,179
February	6,861	11,299	17,906	36,066	1,288
March	5,893	15,779	20,141	41,813	1,349
Tot'l Mar. 31, '87.	3,629,364	2,713,912	2,335,203	8,678,479	4,832

The above table gives the statistical history of the Cherry Grove, Cooper and Balltown fields from the time oil was first run in each district to March 31, 1887. Cherry Grove has produced 3,629,364 barrels, Cooper 2,713,912, and Balltown 2,335,203 barrels. The daily average runs from the three fields during February were 1349 barrels, an increase of 61 barrels over the February figures.

The daily average runs from the Cooper and Henry's Mills section for March were 509 barrels, for February 403 barrels, for January 458 barrels, December 460 barrels, November 417 barrels, October 495 barrels, September 482 barrels, August 558 barrels, July 582 barrels and for June 605 barrels.

The Balltown field had a daily average of 650 barrels in March, 639 barrels in February, 526 barrels in January, 668 barrels in December, 688 barrels in November, 667 barrels in October, 913 barrels in September and 800 barrels in August. Cherry Grove averaged 190 barrels in March 245 barrels in February, 196 barrels in January, 204 barrels in December, 232 barrels in November, 249 barrels in October and 256 barrels in September.

The total pipe line runs from the three fields since oil was first run from Cherry Grove, in May, 1882, up to March 31, 1887, inclusive, has been 8,678,479 barrels, a total daily average of 4832 barrels. The greatest average runs from the Cherry Grove district were in August, 1882, when they reached 24,315 barrels.

LOWER COUNTRY POOLS.

The Thorn Creek, Baldridge and Reibold runs of the National Transit Company averaged 2575 barrels a day in March, 2826 barrels a day in February and 1632 barrels a day in January. Adding the runs of the Pittsburgh Pipe Lines, which includes all oil run from Butler county under one head, the runs from these pools approximated 5500 barrels a day in March, 6025 barrels in February and 2800 barrels in January.

The Cogley field in Clarion county produced 1,723,925 barrels of oil between May 15, 1884, and December 31, 1886, and the runs averaged about 1200 barrels a day in March.

The Rockland or Red Valley district, in Venango county, commenced running oil in October, 1885, and

up to the 31st of March had produced 456,245 barrels; a daily average for 547 days of 832 barrels.

The Tarkill pool in Venango county averaged 1081 barrels a day in March, about 1200 barrels a day in February and 1400 barrels a day in January. This includes the oil run by both pipe lines.

The Pontius or McKeever pool, in Butler county, produced 60,458 barrels in March, 57,609 barrels in February, 71,710 barrels in January, 76,645 barrels in December, 82,962 barrels in November, 90,777 barrels in October, 84,126 barrels in September, 85,331 barrels in August, 70,458 barrels in July and 70,489 barrels in June, 1886.

The runs from the Tipperary district in Venango county were 4800 barrels in October, 6156 barrels in November, 5324 barrels in December, 5543 barrels in January, 5385 barrels in February and 4721 barrels in March.

The runs from the Washington field averaged 6322 barrels in March, 6318 barrels in February and 6930 barrels in January. The Shannopin or Shoustown field runs were 3229 barrels a day in March, 2045 barrels in February and 2250 barrels in January.

SUMMARY of the Statements of the National Transit Company for March and February:

	March. Barrels.	February. Barrels.
Receipts from all sources	1,765,907.67	1,406,483.91
Deliveries	1,990,813.23	1,724,918.33
Gross stocks end of month	32,779,587.01	32,939,761.99
Sediment and surplus	3,630,528.75	3,559,721.32
Total liabilities end of month	29,149,058.26	29,380,040.67
Outstanding acceptances	22,472,039.08	22,401,039.08
Credit balances	6,677,019.18	6,979,001.59

The above "receipts from all sources" for March were made up as follows:

Runs from wells	1,376,756.07
Received from other lines	389,151.60
Received in iron tanks	
Total	1,765,907.67

The above "total deliveries" for March were made up as follows:

Regular shipments	1,932,299.54
Delivered to other lines	58,513.69
Total	1,990,813.23

The above "receipts from all sources" for February were made up as follows:

Runs from wells	1,251,786.12
Received from other lines	154,697.79
Total	1,406,483.91

The above "total deliveries" for February were made up as follows:

Regular shipments	1,672,946.20
Delivered to other lines	51,972.13
Total	1,724,918.33

SUMMARY of the Statement of the Tidewater Pipe Company, Limited, for March, 1887:

	Barrels.
Quantity of crude petroleum in custody at beginning of March	1,501,613.00
Quantity of crude petroleum at close of Mar. 1887	1,686,319.30
Less sediment and surplus	167,253.37
Receipts during March	1,519,065.93
Received in iron tanks	180,639.79
Deliveries during March	58,513.69
Deliveries during March—to refiners	218,860.50
Deliveries during March—to other parties	218,860.50
Outstanding certificates, accepted orders, etc.	784,000.00
Credit balances	735,065.98
Total liabilities, March 31, 1887	1,519,065.93

FEBRUARY SUMMARY.

	Barrels.
Quantity of crude petroleum in custody at beginning of February	1,443,538.64
Quantity of crude petroleum at close of Feb. 1887	1,660,985.36
Less sediment and surplus	159,372.36
Receipts during February	1,501,613.00
Received in iron tanks	160,973.27
Deliveries during February	51,972.13
Deliveries during February—to refiners	152,238.93
Deliveries during February—to other parties	152,238.93
Outstanding certificates, accepted orders, etc.	751,000.00
Credit balances	750,613.00
Total liabilities February 28, 1887	1,501,613.00

Runs, Shipments and Stocks.

RUNS OR RECEIPTS.

PIPE LINE.	MAR., 1887.	FEB., 1887.
National Transit Co.....	1,376,756.07	1,251,786.12
Tidewater.....	180,639.79	160,975.27
Octave Oil Co.....	3,337.00	1,887.00
Keystone Pipe Line.....	30,337.29	31,180.56
Pittsburgh Pipe Line.....	95,943.70	94,147.27
Southwest Pennsylvania.....	294,356.34	234,487.95
Total.....	1,981,370.19	1,774,464.17
Daily average.....	63,915.17	63,373.72

In the above runs only the oil received by the National Transit Co. directly from the wells, is included.

DELIVERIES OR SHIPMENTS.

PIPE LINE.	MAR., 1887.	FEB., 1887.
National Transit Co.....	1,932,299.54	1,672,946.20
Tidewater.....	218,860.50	152,238.93
Octave Oil Co.....	2,003.60	3,430.10
Keystone Pipe Line.....	29,528.99	23,277.91
Pittsburgh Pipe Line.....	95,126.69	95,830.54
Southwest Pennsylvania.....	340,200.29	81,234.02
Total.....	2,618,019.01	2,028,957.60
Less oil transferred between lines.....	339,151.60	154,697.79
Total.....	2,228,867.41	1,874,259.81
Daily average shipments.....	71,898.95	66,937.85

In the above shipments only the oil delivered to refiners is included.

Daily excess of shipments over runs, March.....	7,933.78
Daily excess of shipments over runs, February.....	3,564.10
Daily excess of shipments over runs, January, 1887.....	8,702.88
Daily excess of shipments over runs, December.....	11,270.81
Daily excess of shipments over runs, November.....	10,818.54
Daily excess of shipments over runs, October.....	580.75
Daily excess of runs over shipments, September.....	8,057.13
Daily excess of runs over shipments, August.....	11,931.56
Daily excess of runs over shipments, July.....	5,557.20
Daily excess of runs over shipments, June.....	4,793.41
Daily excess of runs over shipments, May.....	3,967.06
Daily excess of shipments over runs, April.....	4,899.20
Daily excess of shipments over runs, March.....	4,561.80
Daily excess of runs over shipments, February.....	14,701.52
Daily excess of shipments over runs, January, 1886.....	7,825.63

NET STOCKS.

PIPE LINE.	MAR. 31, 1887.	FEB. 28, 1887.
National Transit Co.....	29,149,058.26	29,380,040.67
Tidewater.....	1,519,065.93	1,501,613.00
Octave Oil Co.....	2,961.00	2,914.00
Keystone Pipe Line.....	23,063.14	22,253.63
Pittsburgh Pipe Line.....	4,876.61	4,059.60
Southwest Pennsylvania.....	1,107,960.97	1,153,814.92
Total.....	31,806,985.91	32,064,685.22

Stocks decreased March.....	257,699.31
Stocks decreased February.....	105,988.75
Stocks decreased January, 1887.....	777,975.85
Stocks decreased December.....	357,196.56
Stocks decreased November.....	286,526.86
Stocks decreased October.....	1,790.72
Stocks increased September.....	214,073.99
Stocks increased August.....	362,652.56
Stocks increased July.....	188,510.62
Stocks increased June.....	216,583.97
Stocks increased May.....	110,800.44
Stocks decreased April 1886.....	165,635.61

RECEIPTS. DELIVERIES.

Daily average March.....	63,915	71,899
Daily average February.....	63,374	66,938
Daily average January, 1887.....	62,629	71,332
Daily average December.....	67,857	79,127
Daily average November.....	70,767	81,556
Daily average October.....	76,019	76,600
Daily average September.....	77,989	69,932
Daily average August.....	76,880	64,949
Daily average July.....	74,880	69,323
Daily average June.....	75,811	71,017
Daily average May.....	68,602	64,635
Daily average April 1886.....	64,228	69,127

NOTE—The above figures are in barrels of 42 gallons each, and include only the pipe lines of the New York and Pennsylvania oil regions.

March Production Report.

Reports of the stocks on hand at 5000 Bradford wells showed an average decrease of one barrel to the well during March.

The number of wells in the Bradford field connected with the pipe lines on the first of April is estimated at 14,056. Estimating the entire Bradford region on the basis of one barrel decrease, the total decrease in stocks at wells during March was 14,056 barrels, a daily average of 453 barrels. Subtracting the decrease in stocks from the total runs as reported by the National Transit and Tidewater pipe lines, Bradford's daily average production for March is as follows:

Average Daily Pipe Line Runs.....	Barrels. 22,780
Average Daily decrease of Stocks at Wells.....	453
Bradford's March Production, estimated.....	22,327
February.....	22,930
Average Daily Decrease.....	603

THE ALLEGANY FIELD.

Stocks reported from the Allegany field show an average decrease of .5 barrels to the well, which gives a daily average decrease of 70 barrels. This amount subtracted from the average pipe line runs, places Allegany's daily average production for March at 4930 barrels. The estimated production for February was 5049, for January 5563, for December 5178 and for November 5860 barrels a day.

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

Field.	No. Wells March 1.	No. Wells April 1.	Average per well March 1.	Average per well April 1.
Clarendon and Tiona.....	240	243	24	24
Cherry Grove.....	22	22	44	63
Cooper District.....	106	106	43	41
Lower Country.....	85	85	63	58
Miscellaneous.....	176	174	124	125

Accepting the outside runs, which are made up of the producing fields outside of Bradford and Allegany, as representing the production outside of those two fields, an estimate on the yield for March and February is as follows:

Field.	March. Barrels.	February. Barrels.
Bradford.....	22,327	22,930
Allegany.....	4,930	5,049
Outside Runs.....	36,135	35,745
Total.....	63,392	63,724
Macksburg.....	1,015	1,061
Total with Macksburg.....	64,407	64,785
Decrease per diem.....	378	-----

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region. The runs from Washington are included with the outside field. The Lima runs by the Buckeye Pipe Lines were 9777 barrels a day in March, 7394 barrels in February, 4226 barrels in January, 4374 barrels in December, 4038 barrels in November and 4112 barrels in October.

The following table shows the comparative production for 1884, 1885, 1886 and 1887:

	Bradford.		Allegany.		Outside Runs.		Total Prod.	
	1885.	1884.	1885.	1884.	1885.	1884.	1885.	1884.
January.....	23,675	31,806	8,260	11,264	18,594	16,140	55,529	59,240
February.....	27,051	32,378	7,196	11,607	19,800	18,561	54,047	62,546
March.....	26,444	31,912	7,342	11,763	19,923	19,764	53,709	63,444
April.....	27,413	32,442	7,169	11,848	23,067	19,162	57,649	63,452
May.....	27,231	33,922	7,049	11,547	21,225	19,549	55,505	65,018
June.....	29,272	33,753	7,463	11,108	21,559	19,977	58,294	64,838
July.....	30,309	34,031	7,139	11,218	19,273	20,870	56,721	66,119
August.....	29,858	33,353	7,065	10,384	18,608	22,830	55,531	65,507
September.....	30,205	32,976	7,186	9,877	21,269	22,514	58,660	65,367
October.....	30,180	31,758	6,747	9,356	23,161	22,762	60,088	63,876
November.....	31,355	31,789	7,002	8,642	23,087	23,557	61,444	63,988
December.....	29,223	29,516	6,196	8,193	24,184	22,918	59,603	60,297
	1886.	1885.	1886.	1885.	1886.	1885.	1886.	1885.
January.....	23,677	28,675	6,378	8,260	22,217	18,594	57,272	55,529
February.....	28,586	27,051	6,651	7,196	22,603	19,800	57,840	54,047
March.....	27,947	26,444	6,137	7,342	25,680	19,923	59,764	53,709
April.....	27,807	27,413	6,527	7,169	28,693	23,067	63,027	57,649
May.....	27,148	27,231	6,535	7,049	34,515	21,225	68,198	55,505
June.....	27,860	29,272	6,554	7,463	40,040	21,559	74,454	58,294
July.....	27,046	30,309	6,350	7,139	40,491	19,273	73,887	56,721
August.....	26,695	29,858	6,200	7,065	43,762	22,830	76,657	55,531
September.....	26,674	30,205	5,994	7,186	45,560	21,269	78,228	58,660
October.....	25,454	30,180	6,017	6,747	45,538	23,161	77,009	60,088
November.....	24,503	31,355	5,860	7,002	40,817	23,087	71,180	61,444
December.....	22,422	29,223	5,178	6,196	38,783	24,184	66,383	59,603
	1887.	1886.	1887.	1886.	1887.	1886.	1887.	1886.
January.....	23,269	28,677	5,563	6,378	34,254	22,217	63,086	57,272
February.....	22,930	28,586	5,049	6,651	35,745	22,603	63,724	57,840
March.....	22,327	27,947	4,930	6,137	36,135	25,630	63,392	59,764

POCKET maps of Warren county on sale at AGE office.

RUSSIAN PETROLEUM TRADE.

REPORT OF CONSULAR AGENT CHAMBERS, OF BATOUM.

BAKU.

I HAVE delayed giving information concerning the Russian petroleum industry because of the great difficulty I have experienced in obtaining reliable statistics regarding the business. Not that there is a lack of statistics, for, on the contrary, their volume is bewildering, especially when one tries to make those emanating from different sources agree.

There are several places in Russia where petroleum has been found, but there is only one place where it has been found in such quantities as to threaten serious competition to the American product, and that is in the Baku district, so called from its proximity to the town of Baku. This town is an ancient walled Persian town, but has been in the possession of Russia for many years, and is situated upon the shore of the Caspian Sea, 400 miles south of the Volga river, and 560 miles by rail east of Batoum, on the Black Sea. The city, it is claimed, has a population of more than 60,000, or about five times as great a population as it had in 1870, and is still growing. It is also improving very much in appearance. The old walls are being gradually removed (but it will require many years to entirely obliterate them) to make room for modern (for Russian) buildings and good streets. The streets are being paved with fine cobble stones, which renders unnecessary their former treatment several times each summer to a good dose of "mazoot" (petroleum residuum) to keep the dust and sand from suffocating the inhabitants. The paving is well done, but not sufficiently well done to prevent the occasional high winds from tearing up the stones, or the sudden flood from washing them away.

The climate is tropical and the population largely Asiatic—Tartars, Armenians and Persians. Only an insignificant proportion of the population is European, and that is thoroughly mixed, as every European nation is represented; and there are also a few Americans.

The industry of the city is, of course, petroleum in all its branches, but as it is the principal port of the Caspian Sea, it has also a considerable trade in rice, grain and other Persian products.

The country about Baku, as far as 250 miles west, is very dry and burned looking in summer, with a soil similar to that of Southern California, in the valleys, which produce fair crops of grain, usually harvested in June. It is interspersed with hills totally barren, and salt lakes. There are also small lakes or ponds of fresh water, very far apart, in the vicinity of which there is always more or less vegetation. Fresh water, or what is accepted for fresh water in Baku, is very scarce and expensive, and it is carried to the city from a distance of four or five miles in large earthenware jugs upon the backs of small donkeys.

THE PETROLEUM FIELDS.

The great petroleum producing district is about eight miles north of Baku, and is called Balakhani, taking the name of the Tartar village near it. Different parts of the district are known by other names, such as Sabunchi on the south, the Garden on the east, and Shaitan Bazar in the centre; and local statisticians have again sub-divided the fields into groups, of which there are seventeen in the Balakhani district and one at Surakhani, about five miles southeast of the main district. At Surakhani there have been twenty-three wells drilled, the last one

I think about the year 1879, but I find no estimate for the production of these wells, and I understand that they have produced little or no oil for several years. There is also a large refinery at Surakhani, which is supplied with crude oil by pipe line from Balakhani.

Between two and three miles south of Baku, on the sea shore, is another producing district, the area of which, as at present divided, is very small, called Bibi-Eibat. Twenty-two wells have been drilled here, and fourteen of them were producing in July. In September one of those wells was drilled deeper, resulting in a large flow of oil. The production of this well, it was claimed, was from 30,000 to 40,000 barrels (42 gallons) per day for fifteen days, after which it ceased to flow entirely. This well was less than 700 feet deep, but it was the deepest well in the Bibi-Eibat district, and had been producing from a shallower depth for two years. There is also a large and very modern refinery at this place.

HISTORICAL NOTES.

Petroleum, or "neft," as the Russians call it, was known to exist in the vicinity of Baku hundreds of years ago, but the earliest records of production are from the years 1821 to 1825, in which years the government revenue from petroleum was 131,000 rubles. In 1832 the production was about 750,000 gallons. Since 1832 a record of the annual production has been kept, which record shows a very small increase until the year 1870, when the production reached 3,500,000 gallons. The business until 1873 was a government monopoly, held at various times by different people, the last holder being an American named Mirzoeff, who at that time was a very wealthy man, having, it is said, made his fortune out of the monopoly. The production was also subject to an excise tax, which must have been a heavy charge upon the industry, as the amount of this tax from the year 1873 to 1877 was more than \$1,000,000 on a production approximating 200,000,000 gallons.

The monopoly was abolished in 1873, the business thereafter being open to all who wished to engage in it, and after September 1, 1877, the excise tax was also abolished.

The commercial era of the business dates from the year 1876, when the Nobel Bros., a trio of Swedish engineers, commenced operations. These gentlemen, by remarkable energy, enlisted an immense amount of foreign capital in this business, and to them certainly belongs the honor of building up, from a very insignificant beginning, what to-day is the greatest producing and manufacturing business in Russia.

DRILLING WELLS.

The area of what is considered sure producing territory at Balakhani is between three and four square miles. The surface of this territory is loose sand, and the soil is the same as deep as the drill has penetrated, but is interspersed with thin strata of sandstone and solidified clay, which when brought to the surface, are to all appearance heavy rock, but which can be readily cut with a knife. Owing to the caving of the sand, and the occasional striking of hard, loose stones, which invariably makes what is called a "crooked hole," a very serious obstacle for drillers to overcome, the drilling is exceedingly difficult and expensive. The caving makes the use of iron pipes from the start to finish of the well a necessity. The wells are usually started with heavy riveted pipe (14 to 16 inches inside diameter), which is inserted by driving or with hydraulic jacks, after drilling ahead with a bit larger than the pipe. The large pipe is continued until it collapses at the bottom, or for

some reasons refuses to go further, when another pipe is started small enough to go inside of the first one, and is continued as long as possible, and then again reduced until the oil is found and the well finished, which is usually done with 8-inch pipe. Owing to the necessity of deeper drilling now than formerly, it is becoming necessary to start the wells with a larger size pipe, and Messrs. Nobel are now preparing to commence all new wells with 24-inch pipe.

Russian and German iron is used for the large riveted pipe, and the smaller sizes of pipe, from 10 inches down, which is lap-welded, is also principally German. In the past year efforts have been made to introduce American pipe and oil well supplies, which are unquestionably the best in the world, owing to the longer experience of the American manufacturers, and which can be sold in Baku at very little advance upon the price of other material there. Now, however, these efforts have been relaxed or entirely abandoned. The long credits absolutely necessary to buyers of exceedingly doubtful commercial integrity, and the time required for transportation from America made the business of no value to the Americans.

All kinds of machinery and tools are used at Balakhani. A majority of the drillers use pole tools, but a few are using ropes, as in America. The progressive operators are using either American made engines or engines made in Russia from American patterns. American machinery is, of course, very expensive, as the freight and Russian duty almost double the American price.

COST OF WELLS, AND NUMBER.

The cost of a well at Balakhani varies with the depth to a certain extent. At the present time I think it impossible to drill a well from 700 to 1000 feet for less than \$10,000, and a fair average price is about \$12,000. This does not include the cost of the land, which belongs generally to the operators, although some leases at a royalty of one-third of the production are held. The land belongs to different parties, but a great deal of it was originally government land. The leases obtained from the government were generally at a merely nominal rental or royalty, although land purchased in fee cost much more than it can be had for at present. Now, however, the government will neither rent nor sell any more land, and it holds quite a large tract in the centre of the field, which has not yet been drilled upon. The length of time required to drill a well is also uncertain, as it is from three months to three years; but I think about six to eight months the average time.

Comparing numerous sources as to the number of wells drilling at Baku, I believe the following was nearly correct in January this year (1886):

Producing wells.....	164
Drilling wells.....	104
Abandoned wells.....	200
Total	468

The term "drilling wells" does not mean that work is being actively prosecuted, but that these wells are reported as in various stages of work, *i. e.*, unfinished.

Since the above figures were obtained, I have seen the number of producing wells estimated at 185, but as that was in September, it is quite probable there were a number of new wells completed since January.

An estimate of the production of these 164 wells, based, it was claimed, upon reports from their owners, was 58,000 barrels (of 42 gallons) daily. Considering the number of holidays in Russia, and the fact that for several months in winter, owing to a lack of transportation facilities, the Volga river being closed by ice, the

wells are very irregularly pumped, this estimate is a fair one. Estimating, however, the refined exported at 30 per cent. of the crude, and adding the small amount of crude shipped, will not give more than 31,000 barrels per day as the average daily crude production for 1885.

DEPTH OF WELLS.

The depth of the wells varies from 175 to 1030 feet, there being only one well of the latter depth, and I am not positive that it is producing profitably. The average depth of the wells is steadily increasing, and is now said to be 500 feet as against 350 feet in 1882. The average depth of new wells is, however, more than 500 feet. I think it is over 600 feet. By many it is claimed that the increasing depth of the drilling is proof positive of the exhaustion of the territory, and that the depth of the drilling increases fifty feet for every 500,000,000 gallons of crude taken out, but I have seen no calculations as to the depth of the lower strata of oil. Others claim that both the yield and the quality of the crude improves with deeper drilling, and that the territory will continue to produce from much greater depths. From my own observation, I am inclined to believe that the quality of the crude as an illuminant improves as the drilling gets deeper, but as to the increase in the yield I am doubtful. The following figures are given as a comparison of the yield of various parts of the territory at different depths:

Locality.	Depths of wells.	No. of wells.	Daily production of each well.
	Fect.		Galloos.
At Balakhani.....	175 to 280	7	7,855
	230 to 350	7	17,000
	350 to 420	9	17,000
	420 to 490	13	17,500
	490 to 560	4	16,000
Group V.—(A very rich section on the north of the field).....	560 to 630	2	25,000
	245 to 350	12	11,000
	350 to 420	6	13,300
	420 to 490	8	10,500
	490 to 560	-----	No wells.
Sabunchi.....	560 to 630	2	25,000
	630 to 730	1	60,000
	350 to 420	8	15,435
	420 to 490	8	14,685
	490 to 560	-----	No wells.
Shaitan Bazar.....	560 to 630	2	22,500
	175 to 280	6	8,330
	280 to 350	-----	No wells.
	350 to 420	2	10,000
	420 to 490	2	15,000
	490 to 630	-----	No wells.
	630 to 700	1	60,000

This is intended to show a general increase in yield in all parts of the field from deeper drilling, but the fact that the shallow wells are all old, while the deeper ones are comparatively new, must not be overlooked, and while it does not make it perfectly clear that the deeper wells are more productive than the shallow ones, it certainly shows no exhaustion of the territory.

FLOW OF WELLS.

When Balakhani oil wells do not flow they are pumped with what is called in the American oil fields a bailer, *i. e.*, a piece of pipe from 15 to 30 feet long, fitted with a valve at the bottom. This pump is dropped into the well by means of a rope and drawn out by steam power (the weight of the valve and the oil upon it keeping it closed while the pump is being drawn out), and emptied into a small receiving tank on the derrick floor, from which the crude flows through a wooden trough or dirt ditch into the main reservoir. The pump or boiler used varies according to the size of the well pipe, as it is made of a pipe to run freely inside of the well pipe; but they are much larger than those commonly used in America, and hold from two to ten barrels each.

Many of the wells flow naturally and with great force when the crude is struck. The flowing wells, or, as the Russians call them, "fountains," are fitted upon the top of the well pipe with a gate or slide valve, and upon the

top of this valve is an elbow of the same sized pipe as the well pipe, which directs the flow, when the valve is opened, horizontally into the trough or ditch. Many of these fountains can be opened and closed at will. If oil is required they are opened, and the oil allowed to flow until the necessary quantity is obtained, when they are again closed. This, of course, is a great advantage, the well itself answering the purpose of an always full tank or reservoir.

The quantity of crude produced by some of these flowing wells is incredible to those who have never seen one of them flowing. Fortunately I have seen several of them flowing, and were I to give the estimate I formed of the amount of their production, it would exceed the actual amount of their production considerably. Through the kindness of Mr. Tornudd, the general manager of Nobel Bros. for the past five years, I am enabled to give figures regarding the production of several of the largest wells which are absolutely correct.

The most productive well ever drilled at Balakhani was Nobels' No. 15. This well, while it did not flow so furiously as many others, flowed steadily the full size of the pipe (8 inches) when opened for years. It was handled just as a large tank would be, only opened when oil was required. I do not know the exact length of time it produced profitably, but its total production was over 1,800,000 barrels (42 gallons). Nobels' No. 9 was another large well. It was the largest well ever struck for the first nine days, as it flowed that length of time steadily a solid column of oil the full size of the pipe (8-inch) to a height of two to three hundred feet. The estimated production of this well for the first nine days was 50,000 barrels per day, and its total production for the thirty-two days it flowed was over 900,000 barrels. Last June, Nobels struck a well, No. 32, which was the most difficult to control they ever had. This well was finished with 8-inch pipe, and after it had flowed furiously for a day or two they succeeded in shutting it off by using four 8-inch gate valves on the top of the pipe. They then worked a week strengthening the derrick, by using heavy timbers from the tops of the valves to the sides of the derrick and other timbers across the derrick, until they had the derrick a mass of heavy timbers.

While this work was being done the valves commenced to leak, and the well was producing oil faster than it could be pumped away through two lines of pipes, one 3-inch and one 4-inch. They finally added a 6-inch line, with a large pump, to their pipe line capacity, and then attempted to open the valves. In a very few minutes the valves and almost all of the network of timbers in the derrick were blown away, and the well flowed terrifically for several hours, not oil, but stones and mud. It flowed intermittently dirt and stones and oil for about fifteen days, when it quit entirely, having produced over 100,000 barrels of oil. All the large wells have stopped flowing in the same abrupt manner, and the same cause of stoppage is assigned to all of them, viz., the collapsing of the pipe at the bottom of the well.

The pipe in this well (No. 32) was American, and it was hoped that it would stand the test, the first of the kind, imposed upon it, as it is certainly much superior to any of the other pipe used here; but these hopes were not realized, at least not fully, for although it did not stand this test entirely, it stood it for fifteen days, and it was a much more severe test than any other pipe has been given. The depth of this well was 860 feet, and at that time it was the deepest producing well in the field.

The length of the profitably producing life of Balak-

hani wells varies greatly, and an average is unobtainable. As I have already shown, some produce for years, while others last only days. They do not seem to affect each other's production, even when within a few feet of each other and producing from about the same depth. The oil contains a great deal of sand, and some of the flowing wells throw out immense quantities of sand with the oil, sufficient in several cases to completely bury the engine house and outhouses in their vicinity.

I am again indebted to Mr. Tornudd for the following information regarding the production of the wells of Nobel Bros.:

Nobel Bros. have drilled 74 wells in the Balakhani district, of which number 32 are now producing. Of the 74 wells, 22 have produced over 115,000 barrels (42 gallons) each, and the aggregate production of the 22 wells to September was over 7,600,000 barrels, an average of more than 345,000 barrels each. Eight other wells have produced nearly 100,000 barrels each, and almost all of the 74 wells have been profitable producers.

[TO BE CONTINUED.]

THE old firm of Morris, Tasker & Co. is once more in the field and again manufacturing the justly celebrated oil, gas and line pipeing, with which their name has so long been connected. The mills and machinery at Philadelphia and New Castle have been remodeled and improved, making them among the largest and most complete manufacturing establishments in the world. The annealed steel coupling again finds an able exponent in Mr. S. G. Bayne, who is prepared to take orders for pipe in any quantity, from an amount sufficient to tube a Grand Valley well to laying a gas line from McKean county to New York city.

PROF. ORTON'S Preliminary Report on Petroleum and Inflammable Gas in Ohio, with supplement, giving production of the most important gas wells, the results of the search after gas in Indiana, and a valuable table of tidewater elevations, is published by Mr. A. H. Smythe, of Columbus, Ohio. Copies can be secured at the AGE office, or will be sent by mail to any address at the uniform price of \$1 each in paper, or \$1.25 bound in cloth. Address THE PETROLEUM AGE, Bradford, Pa.

W. C. WALKER & Co.'s jars hardly need an introduction to oil region people. Their justly merited reputation is due to the fact that every set is the work of Mr. Walker's own hands, and none leave the shop but those that a careful and skilled workman is proud to admit as of his own manufacture. The firm is now making a first-class drilling engine and is prepared to ship complete outfits for drilling oil, water or gas wells, to any part of the country at short notice.

FRANKLIN held an enthusiastic meeting March 31st and adopted resolutions favoring the early passage of the Billingsley bill.

BLUE print maps of the Reibold Oil District furnished from the AGE office for one dollar.

A GAUGE of the Reibold pool, taken April 16th, showed a production of 4962 barrels from fifty wells.

MARSHALL, Mo., and Wabash, Ind., are drilling for natural gas.

MARCH OPERATIONS.

THE ENTIRE REGION—WELLS COMPLETED, WELLS DRILLING, AND RIGS UP AND BUILDING.

WELLS COMPLETED IN MARCH, 1887.

Allegheny Field.

Twp.	Owner.	Barrels.
Scioto, 46, L G Norton		4
Wirt, 30, Empire Gas Co		gas
Clarksville, 3, M Jordan No 3		2
" 5, (Wetherbee) Harris, Johnson & Co No 11		5
" 5, Werthman & Congdon		8
" 10, Smith & Bartlett No 1		5
" 12, (Thurston) Barton, Ack- erly & Co, No 33		5
Bridsall twp, I Willets & Co		dry
Wells completed		8
Production		29
Dry		2

Bradford Field.

East and West Branches.

Warrant 2263, Van Vleck & Mitchell No 41	10
B O Co, Western Oil Co No 7	5
Mack, Manufacturers' Gas Co No 3	dry
Hatfield, Wood & Young No 4	3

Foster Brook.

Lafferty, Van Vleck & Gifford No 60	10
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Indian Creek.

H Loop, Franchot Bros No 38	5
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Cole Creek.

Bingham, lot 588, Associated Producers No 64	20
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Kinza.

Guffey & Hulings, Union Oil Co No 70	10
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Miscellaneous.

Woodmansee, (Allegheny) Stevens Bros	dry
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Wells completed	19
Production	63
Dry	2

Warren and Forest.

GLADE AND OTHER TOWNS.

Kinza Village.

Hodge, Morse, Collins & Heasley No 1	60
White, " No 8	80
Willie Run, Smith, Bright & Co No 7	10
5564, Sill, Odell & Barnsdall	dry

Wells completed	4
Production	150
Dry	1

Clarendon.

35, Bell & Hazeltine	5
107, J A Waterhouse & Co No 19	5
531, S Short & Son No 17	5
554, Clark & Foster	dry
558, Goal Bros No 2	3
464, Columbia Oil Co	6

Wells completed	6
Production	24
Dry	1

Tiona.

75, (lot 34) Fert'g & McKinney No 10	5
75, " No 11	6
161, Ed O'Donnell	5
161, Helm & Hague	5
201, (Hague) Wesley Chambers No 10	6
240, W W Winger No 6	5
244, Horton, Crary & Co No 22	6
324, W W Winger No 2	4

Wells completed	8
Production	42
Dry	0

Balltown.

741, Horton, Crary & Kraeer No 2	3
5214, James C Welsh	12

Wells completed	2
Production	15
Dry	0

Kane.

344, Treat & Mallory No 9	5
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Wells completed	1
Production	5
Dry	0

Grand Valley.

David Ash, Reno Oil Co	dry
Lot 327, McConnell & Co	3
Phil lands, Crippens & Phillips No 4	5
Knapp, L B Wood & Co No 1	12
Lot 150, Nelson Farrell No 11	10

Wells completed	5
Production	30
Dry	1

Miscellaneous.

3672, Clark & Foster	dry
2033, Porter, Thyng & Co No 2	5

Forest County.

Hickory twp, Taylor, Torrey & Co	dry
Shamburg, Young & Loucks	10
Tionesta, Mealey & Co	dry
5504, Shannon syndicate	dry

Wells completed	6
Production	15
Dry	4

Lower Country.

Venango.

Farm.	Operator.	Barrels.
600 acres, Oil City Fuel Supply Co	No 2	gas
" "	No 4	gas
Fox, " "		gas
Christie & Stranch " "		gas
Fertig, " "	No 2	gas
Kenan, Kirkwood & Barcroft		12
Buchanan, J H McCandless		10
Nicklin, Shaffer & Co		5

Vicinity Pleasantville.

Burchfield, Burchfield	dry
McClune, W P Black	gas
Egbert, " "	3
Tryonville, Farmers' Oil Co	dry

Tipperary.

Siggins, Taylor, Torrey & Murphy No 8	dry
" No 9	10
Saddler, Riddle & Lynch	dry
Heckathorn, Phinney & Bishop No 4	dry
Wilhelm, Deitrich & Warfield	5
Big Meadow, (Blakeley) Canning & Reese	12
Shannon, Stubler & Co	dry
Hall's Run, Berlin & Sheasley	5

Tarkill.

Houser, I H Webb & Co No 9	10
" A P Dale & Co No 8	dry
Huff, Clark & Foster	dry

Rockland or Red Valley.

Wicks, W H H Piper No 12	10
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Vicinity Emlenton.

Dr Crawford, Wm Weaver No 7	8
Anderson, Forest Oil Co	dry

Bullion.

Rankin, Forest Oil Co	dry
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Wells completed	27
Production	90
Dry	16

Clarion.

Baugert, Kerstetter	12
Smith, Wolf, Kugler & Heeter	20
Black, Clover Bros	dry
Hess, Hess & Sackett	12
Wagner & Curl, Wagner & Hahn	6
Smith, Smith & Wagner	5
Kifer, Moonlight Oil Co No 1	10
Edmunds, Urquhart & Lavens No 10	20
Jones, (Corsica) Deitrich & Young	dry
Newmanville, Bowman & Co	dry

Wells completed	10
Production	85
Dry	3

Butler and Armstrong.

Coyle, Fisher Oil Co No 1	15
Chas Duffey, M Finnegan No 5	25
McKeever heirs, Dennison & Fleegler	dry
Maloney, Dan Burns	dry
Hiram Rankin, Thos M Marshall	dry
Frederick, Brady & Simpson No 2	25
J Coyle, Bott & Story	10
Daubenspeck, Shenango Gas Co No 1	gas
" No 2	gas
Armstrong, Phillips & Osborne	gas
Fowler, Mutual Gas Co	gas
Heid, T W Phillips & D Osborne No 6	5
" " No 7	5
" " No 8	30
Markle, " No 4	150
" " No 5	25
" " No 6	210
" " No 7	12
Gelbech, " No 1	110
Blakeley, " No 3	13
Heid, Leidecker Bros No 7 est	25
Blakeley, " No 2	280
" Johnson & Root No 1	150
Goering, Breakneck Oil Co	dry

St. Joe.

Kelley, T W Phillips & D Osborne	dry
Mr Hasler, Christie & Co est	10
Shultz, Frazier & Co	10

Thorn Creek.

Burton, Thayer & Crosby No 5	20
" Shaffer & Co	30

Wells completed	29
Production	1162
Dry	9

Washington.

Cameron, Willets, Young & Chartiers Oil Co No 8 est	50
" " No 9	50
" " No 2	277
Fergus, " "	40
Taylor, Galligan & Young No 2	75
Lizzie McGahey, Mascot Oil Co No 6	100
W J Munce, John McKown No 12	416
Workman, Union Oil Co No 1	140
" " No 2	10
Watson, Butler & Co No 2	10
Taylorstown, (Sheller) Aiken, Stone & Co	dry

Wells completed	10
Production	1152
Dry	1

Shannopin.

A P Morrow, Raccoon Oil Co & Solar Oil Co No 21	600
" " No 22	300
McCoy, Zeigler & Co	20
Thompson, Union Oil Co	dry
J McLaughlin, J W Craig & Co	dry
Jas Harper, Hopewell Oil Co	dry
Anderson, Nameless Oil Co	dry
Crafton, Lamb & Co	5

Wells completed	8
Production	925
Dry	4

DRILLING WELLS.

RIGS UP AND BUILDING MARCH 31, 1887.

Allegheny Field.

Lot.	Owner.	Depth.
3, Coyle & Simon (old)		rig
12, Allen & Morse (old)		rig
12, Griffin & Co No 10 (old)		rig
50, Pease & Coyle No 9 (old)		rig
New rigs		0
Old rigs		4
Drilling		0
Total		4

Alma.

3, M J McMullan & Co No 5 (old)	rig
23, Vance & Hor on (old)	rig
26, Willets & Elliott (old)	rig
26, Wyvell & Miles No 2 (fishing)	sand
51, Sawyer & Co (old)	rig
120, McCalmont Oil Co No 10 (old)	rig
New rigs	0
Old rigs	5
Drilling	1
Total	6

<i>Wirt.</i>			Ellis, Dr Chrisman (old) ----- rig			105, Sam Tait Jr No 5 ----- drilling		
47, (Voorhees) Applebee & Mix No 2 (old) -----	rig		New rigs -----	1		104, O'Donnell & Hill No 4 -----	100	
48, (Church) McNorton, Deming & Co No 2 (old) -----	rig		Old rigs -----	6		107, W B Roberts & Son No 20 (old) -----	rig	
52, (Jacob Jordan) Wilson & Johnston No 9 (old) -----	rig		Drilling -----	2		511, S Short & Son No 18 -----	rig	
55, (Orson Witter) P M Shannon & Co No 1 (old) -----	rig		Total -----	9		553, Joe Jenkins No 2 (old) -----	rig	
61, (J Jordan) Ackerly, Barton & Co (old) -----	rig		<i>Foster Brook.</i>			556, J A Waterhouse & Co No 25 old	rig	
61, (Isaiah Jordan) Lester, Jordan & Co No 6 (old) -----	rig		E T Co, Kervin & Co No 10 (old) -----	rig		556, " No 26 old	rig	
61, " " No 7 (old) -----	rig		C B & H, Juter & Yager (old) -----	rig		556, " No 27 old	rig	
62, (Peterson) Limekiln Club No 4 (old) -----	rig		" Clark, Cooper & Co No 9 (old) -----	rig		562, Goal Bros No 3 -----	drilling	
62, (Latham) " No 1 (old) -----	rig		" Burns & Monroe (old) -----	rig		New rigs -----	3	
62, (Peterson) Barton, Hammond & O'Neil No 6 -----	900		" Watson Oil Co No 49 -----	rig		Old rigs -----	6	
47, (Johnson) McQueen & Thurston No 1 -----	drilling		" " No 50 -----	rig bldg		Drilling -----	6	
New rigs -----	0		New rigs -----	2		Total -----	15	
Old rigs -----	9		Old rigs -----	4		<i>Tiona.</i>		
Drilling -----	2		Drilling -----	0		200, (Hague) Wesley Chambers No 5 -----	100	
Total -----	11		Total -----	6		201, Keegan, Sage & Co -----	drilling	
<i>Bolivar.</i>			<i>Four Mile.</i>			244, Horton, Crary & Co No 23 -----	drilling	
12, Wood & Co (old) -----	rig		Van Campen, Coldren & Vance (old) -----	rig		244, " No 24 -----	rig	
23, F C Streeter & Co No 12 (old) -----	rig		" Jas K Van Campen No 3 (old) -----	rig		284, Watson & Mitchell No 8 (old) -----	rig	
New rigs -----	0		Dye, Manhattan Oil Co No 5 (old) -----	rig		New rigs -----	1	
Old rigs -----	2		New rigs -----	0		Old rigs -----	1	
Drilling -----	0		Old rigs -----	3		Drilling -----	3	
Total -----	2		Drilling -----	0		Total -----	5	
<i>Genesee.</i>			Total -----	3		<i>Cooper District.</i>		
14, Merwin (old) -----	rig		<i>Indian Creek.</i>			407, Shank & Stewart No 9 (old) -----	rig	
22, I Willetts No 14 (old) -----	rig		North Branch, Franchot Bros (old) -----	1 rig		407, " No 10 (old) -----	rig	
22, " No 15 (old) -----	rig		Hamlin, M B Squiers No 4 (old) -----	rig		New rigs -----	0	
22, " No 16 (old) -----	rig		Weston, Williams & Franchot No 13 -----	sand		Old rigs -----	2	
22, " No 17 (old) -----	rig		Gale, G N Moore No 11 -----	drilling		Drilling -----	0	
22, " No 18 (old) -----	rig		" " No 12 -----	rig		Total -----	2	
23, Coughlin (old) -----	rig		" Cook & Co -----	drilling		<i>Balltown.</i>		
29, William Cranston (old) -----	rig		H Loop, Franchot Bros No 42 -----	drilling		3194 Poreupine Oil Co No 39 (old) -----	rig	
New rigs -----	0		New rigs -----	1		3195, (Crisman) N F Clark No 14 (old) -----	rig	
Old rigs -----	8		Old rigs -----	2		741, Horton, Crary & Kraer No 3 -----	drilling	
Drilling -----	0		Drilling -----	3		5214, J C Welsh -----	drilling	
Total -----	8		Total -----	6		New rigs -----	0	
<i>Clarksville.</i>			<i>Cole Creek.</i>			Old rigs -----	2	
5, Lane, Lane Oil Co No 7 (old) -----	rig		Warrant 2263, Union Oil Co No 6 (old) -----	rig		Drilling -----	2	
6, (Seever) Ackerly, Barton & Co No 9 (old) -----	rig		" 2263, " No 7 (old) -----	rig		Total -----	4	
6, (Hamilton) Ackerly, Barton & Co No 23 (old) -----	rig		Bingham, lot 69, Bennett & Thompson No 11 (old) -----	rig		<i>Kane.</i>		
9, Heuston & Brecht No 4 (old) -----	rig		" lot 477, Tucker & Rolfe No 3 (old) -----	rig		343, (Looker) Ernhart & Co No 2 -----	drilling	
9, Merritt (old) -----	rig		" lot 582, Ass'd Producers No 65 -----	1200		343, " No 3 (old) -----	rig	
10, (Smith) Fritz & McKelvy -----	rig bldg		" lot 588, " No 66 -----	rig		345, Clinton & Swayne No 4 -----	drilling	
New rigs -----	1		" lot --, C P Byron No 14 (old) -----	rig		344, Treat & Mallory No 8 (old) -----	rig	
Old rigs -----	5		New rigs -----	1		420, Coast & Sons No 24 (old) -----	rig	
Drilling -----	0		Old rigs -----	5		3767, Craig & Cappeau No 40 (old) -----	rig	
Total -----	6		Drilling -----	1		New rigs -----	0	
<i>Bradford Field.</i>			Total -----	7		Old rigs and shut down -----	4	
<i>East and West Branches.</i>			<i>Kinzua.</i>			Drilling -----	2	
Warrant 2263, Van Vleck & Mitchell No 42 -----	drilling		Guffy & Hulings, Union Oil Co No 71 -----	rig		Total -----	6	
" 2263, R J Straight No 23 -----	drilling		Wood's lease, Stewart & Co -----	drilling		<i>Grand Valley.</i>		
Maek, Columbia Oil Co (old) -----	rig		Bonanza, Newell & Quigley No 2 -----	drilling		Lot 327, (Upton) McConnell & Co -----	rig	
" Fisher Oil Co No 19 (old) -----	rig		Lot 123, P T & W C Kennedy No 6 -----	drilling		" 330, (Reinhart) Boiles & Roberts -----	sand	
" Manufacturers Gas Co No 4 -----	drilling		Warrant 2241, Keating Oil Co (shut down) -----	sand		Blakeslee, Miller & Crippens No 10 -----	rig	
" " No 5 -----	rig bldg		New rigs -----	1		Phil lands, Crippens & Phillips No 5 -----	100	
King, Wood & Young No 2 (shut down) -----	100		Old rigs and shut down -----	1		Campbell, L B Wood & Co No 13 -----	drilling	
Hatfield Wood & Young No 5 -----	rig bldg		Drilling -----	3		" " No 14 -----	drilling	
Paton, McClure & Co (old) -----	rig		Total -----	5		" " No 15 -----	rig	
Hinehey, McMurray Bros No 6 (old) -----	rig		<i>Warren and Forest.</i>			(Wood pur,) National Oil Co -----	drilling	
Clark, McCray Bros (old) -----	rig		GLADE AND OTHER TOWNS.			" " -----	2 rigs	
<i>Quintuple.</i>			<i>Kinzua Village.</i>			Rouse, " -----	drilling	
25, O H Strong (old) -----	rig		Morrison, Anchor Oil Co No 13 -----	sand		Lot 150, Ne'son Farrell No 12 -----	drilling	
44, J W Humphrey (old) -----	rig		White, Morse & Collins No 9 -----	drilling		" 151, Cadwallader & Co No 2 -----	sand	
280, E T Howes (old) -----	rig		Weed, " No 8 -----	sand		" 135, Emery & Ralston (shut down) -----	sand	
New rigs -----	2		" " No 9 -----	drilling		" 137, G P Kepler & Co (old) -----	rig	
Old rigs and shut down -----	9		" " No 10 -----	rig		" 238, J B Jennings & Grandin (old) -----	rig	
Drilling -----	3		" " No 11 -----	rig bldg		Spring Creek, (Shaw) Stewart & Co -----	rig	
Total -----	14		Willie Run, Smith, Bright & Co No 8 -----	drilling		R T Gilson, Stewart & Co No 3 -----	sand	
<i>Knapp's Creek.</i>			5564, " No 1 -----	rig		Enterprise, (lot 54) S P Robinson No 2 -----	rig	
Matthews, C B Whitehead No 6 (old) -----	rig		New rigs -----	3		" (Sutliff) Coldron & Co -----	rig	
Borden, T P Thompson (old) -----	2 rigs		Old rigs -----	0		New rigs -----	8	
" J S Rogers -----	drilling		Drilling -----	5		Old rigs and shut down -----	3	
Duke, J We t No 7 (old) -----	rig		Total -----	8		Drilling -----	9	
" No 8 (old) -----	rig		<i>Clarendon.</i>			Total -----	20	
Keating, Forest Oil Co No 54 -----	drilling		35, Henderson & Murphy -----	sand		<i>Miscellaneous—Elk County.</i>		
Erskine, Doe & Smith No 2 -----	rig bldg		76, Curtis & Armstrong No 2 -----	drilling		2026, S B Hughes & Co (old) -----	rig	
			463, O'Neil & Hue -----	rig		2565, C G Thyng -----	sand	
			463, Wm Spence -----	rig		2019, Clark & Foster -----	sand	
			463, Ed O'Donnell No 2 -----	sand		2033, " -----	rig	
			105, Tucker & Co (old) -----	rig		3663, " -----	drilling	
						3664, " -----	drilling	
						2033, Porter, Thyng & Co No 3 -----	drilling	
						" No 4 -----	rig	
						2032, Boggs, Rosenberg & Co No 3 -----	drilling	
						2033, Highland Oil Co No 1 -----	drilling	
						3663, Boyer, Simpson & Co No 3 -----	drilling	

2027, Taylor, Torrey & Co No 1.....drilling
4022, Coast & Sons (old).....rig
Wilcox, (2426) Markham & Co.....drilling
Climax, Ellis & Co.....drilling

Warren and Forest Counties.

Sutton Hill, A F Fritts (old).....rig
Youngsville, (John Siggins) Scranton Oil Co (old).....rig
Harmony, (Rhodes) Dunham & Co.....drilling
Pineville, (Landers) " No 6.....rig
New rigs.....3
Old rigs.....4
Drilling.....12
Total.....19

Lower Country.

Venango and Other Sections.

Allegheny Bank lands, Oil City Fuel Supply Co.....rig
McBride, Thomas Smith (old).....rig
Kaufman, A P Dale No 9 (old).....rig
" " No 10.....rig
Osmer, Galbraith & Parker (old).....rig
Mt Hope, Dr Galbraith No 3.....drilling
Slab Furnace, S P McCalmont (old).....rig
Main, W J Robinson (old).....rig
Rynd, Wratten & Co (old).....rig
Buchanan, J M McCandless.....rig
Columbia, Columbia Oil Co.....sand
Victory twp, Conway Bros.....sand
Tract 47, J J Fisher No 10.....rig
Eagle Rock, Daggett & Co (shut down).....400
Pithole, (Blank) Duke & App'ebec (old).....rig
Griffin, James Pustell No 3.....drilling
Sunville, (Grove) Phillips Bros.....drilling
Wallaceville, ".....rig
Cherry Tree, Hamilton Bros.....rig bldg
Pioneer, (Keech) J Stillwagon.....drilling
" (McElheney) Pres McCray rig bldg

Vicinity Pleasantville.

Rhodes & Beaver, W P Black.....drilling
Landers, ".....rig
Tallman, (Shamburg) ".....rig
McCune, ".....rig
Kepler, Karney Bros.....drilling
Sam Fleming, Siggins & Son.....drilling
Sheppard, J Sheppard.....rig

Tipperary, Hall's Run, Etc.

Moore, Bee's & Co No 3 (shut down) 750
J Fox, " No 2.....sand
Siggins, Taylor, Torrey & Murphy No 10.....drilling
Moore, Speechley & Co No 2 (old).....rig
Heckathorn, Phinney & B shop No 5 rig
Big Meadow, Huff, Reedy & Osborne.....rig bldg
McCalmont, S P McCalmont.....rig
Saddler, Wolf & Kugler No 2.....rig bldg
Burns, Geo Duncan.....drilling
Sleppey, Judd & Geiser.....rig
Church lot, Deitrich & Warfield.....drilling
Willis, ".....sand
Wid Shafer, ".....drilling
Coal lands, J B Smithman.....rig
Toberer, Gailley, Roe & McBride.....rig

Tarkill.

Alex Hill, Fisher & Judd.....sand
Thompson, Hess & Sackett No 2.....200

Rockland or Red Valley.

Weeks, W H H Piper No 13.....drilling
" " No 14.....rig

Nickleville.

Watson, Watson Bros.....sand
Henston, Myers Bros.....drilling

Vicinity Emlenton.

D Russell, Baum & Co (old).....rig
W P Grant, J V Ritts (old).....rig
Russell, Thos Griffin.....rig
King, Wm King.....drilling
Johnson, Shell & Knight.....drilling
Kohlmeyer, Daniel Wilbur & Co.....drilling
Dr Crawford, Wm Weaver No 8.....rig

Bullion.

Crawford, Hoffman & Co.....500
Hovis, Hovis & Co.....drilling
Dougherty, Hovis & Co (old).....rig

New rigs.....22
Old rigs and shut down.....13
Drilling.....24
Total estimated.....59

Clarion.

Bressel, Berlin & Sons No 3.....rig bldg
Widiken, " No 1.....rig bldg
Black, " No 2.....400

Cotterman, Black Bros.....500
Stumpner, Stumpner Bros.....rig bldg
Hess, Hess & Sackett.....200
Edmunds, Urquhart & Lavens.....rig bldg
Whit hill, Harrington & Co.....600
Delo, P F Kribbs & Co.....sand
Amsler, Amsler Bros.....rig bldg
Smith, Smith & Wagner No 2.....rig bldg
Kifer, Moon light Oil Co No 2.....200
Berlin, Berlin & Sons No 15 (old).....rig
John Henel, Koch Oil Co No 8 (old) rig
Lloyd, Dr Metzger (old).....rig
Shreffler, McCaillom & Co (old).....rig
Wagner & Curl, J V Ritts (old).....rig
Heasley, Heasley & Co (old).....rig
Brown, J V Ritts (old).....rig
Reidsburg, M L Lockwood.....rig
" Iceper, Arnold & Co.....rig
Stover, Stover & Co.....rig
Johnson, Johnson & Buzzard.....drilling

New rigs.....9
Old rigs.....7
Wells drilling.....7
Total.....23

Butler and Armstrong.

F Miller, W G Crawford & Co (old).....rig
Chas Duffey, Hoch & Co (old).....rig
J Kline, Westernman & Co (old).....rig
Hough'on, Forquer Bros No 2 (old) rig
Jas Coyle, M P Black & Co No 1.....1200
" " No 2.....700
Washington twp, Fletcher farm, Armstrong, Campbell & Co (old) rig
Gumper, Ward & Stoup (old).....rig
Steelin, T W Phillips & D Osborne rig bldg
Markle, " No 8.....1100
" " No 9.....800
" " No 10.....600
" " No 11.....300
Gelbech, T W Phillips No 2.....900
" " No 3.....rig bldg
May, T W Phillips & D Osborne.....rig
Heid, Leidecker Bros No 8.....1200
Blakeley, " No 3.....1200
" " No 4.....1200
" " No 5.....1100
" Johnson & Root No 2.....rig
John Miller, P Smick & Lenz.....sand
John Staples, M P Black & Co.....900
Behm, Winkle Oil Co.....800
Harmony, Gibson & Gabagen-Lenz rig bldg
Blakeley, Coast & Son.....1200
Duffey, Branch Creek Oil Co.....drilling
Peter Fennel, Greenlee & Semple
" " No 1.....100
" " No 2.....600
McCrea, Fisher Oil Co.....600
Thompson, Unknown.....rig bldg
Rev Hickey, Brushwood Oil Co No 5 (fishing).....sand
Herman Station, Bursack, National Transit Co (for gas).....sand
Duffey, Shenango Gas Co (for gas) 1000
Enlid, Fisher Oil Co.....rig
Chas Duffey, McBride & Campbell No 5.....rig bldg
Hineman, Meidrum Bros & Co.....drilling

Martinsburg.

Knox, Brown & Stanton.....drilling
" Hoffman & Shanfelt.....300
Martinsburg, Jordan & Co.....drilling
Fletcher heirs, S W McKee.....rig

Thorn Creek.

Maharg, Bolard & Smith No 3 fishing 1200
Klingler, Thayer & Crosby.....sand
Dixon, Christie & Co.....rig
Cooper, Thayer & Crosby & Anchor Oil Co.....300
Burton, Russell & Greenlee.....300
" Collins & Reeder.....500
Klingler, Iman, Waldron & Co.....rig

New rigs.....11
Old rigs.....6
Drilling.....29
Total.....46

Washington.

I Wilson, Forest Oil Co (old).....rig
Johnson, " (old).....rig
Barre, " No 7 fishing sand
" " No 12 fishing sand
" " No 13.....1600
Morgan, Union Oil Co No 7.....2475
" " No 8.....2050
" " No 9.....2300
Wm Davis, " No 6 sand.....2544
Taylor, Union Oil Co No 6 sand.....2455
Wade, B B Campbell & Co No 2.....1750
" " No 3.....2000
W J Munce, John McKeown No 13 (sand).....2375
" " No 14.....1450
" " No 15.....1100
" " No 16.....500

Martin, John McKeown No 1.....2200
Martin heirs, " No 2.....2250
Smith, Willets, Young & Chartiers Oil Co No 4.....1650
Cameron, Willets, Young & Chartiers Oil Co No 3.....2500
" " No 10.....1450
Baker's Station, Dyer & Roberts.....1800
Munce Heirs, Willets & Son No 18.....sand
" " No 23 (old).....rig
" " No 24 (old).....rig
" " No 26 (old).....rig
" " No 27 fish'g sand
Cradle Factory lot, Miller & Co No 2 1750
Montgomery, Montgomery No 1.....1600
Coal Center, Hornbake (shut down) 1100
Martin, Central Oil Co No 2.....sand
Wiles, C O & G Co No 1.....1800
" " No 2.....rig bldg
Rooney, Reed & Co (old).....rig
McNary, Craig & Co.....2350
McKeesport, Stone & Co.....drilling
McKenna, C O & Gas Co.....2330
Bellvernon, Schmertz (for gas).....drilling
Thome, Lee & Shank No 3.....1000
Wright, Craig & Co No 6.....rig
Martin, Asad Producers Co No 2.....rig
Happer, A G Happer.....500
Whittlesee, Caldwell & Co No 2.....rig bldg

Taylorstown.

Leech, West Virginia Nat Gas Co No 1 (for gas).....1800
McMannis, Robbins & Guffey.....1750
Woodburne, Forst Oil Co & Craig-Ebenezer Davis. Wheeling Nat Gas Co No 1 (for gas).....1400
R Hamilton, Wheeling Natural Gas Co No 1 (for gas).....100
Blayne, Hart Bros & Co No 2.....500
" " No 3.....rig
McGraw Run, Wheeling Gas & Oil Co.....1200
Carrothers, West Virginia Natural Gas Co.....rig bldg
Donohy, ".....rig bldg
R Cundell, Vandergrift & Roberts No 2.....rig bldg

New rigs.....7
Old rigs and shut down.....7
Drilling.....36
Total.....50

Shannopin.

Thos Pinkerton, J S McKelvy (old) rig
Charles Eichel, Raccoon Oil Co No 4 (old).....rig
A P Morrow, Raccoon Oil Co & Solar Oil Co No 23.....rig
Stevenson, Raccoon Oil Co No 5.....1500
" " No 6 old rig
Davis & Duff, Union Oil Co.....drilling
Stone, McFarland & Co.....rig bldg
Good, J M Guffey & Co.....1850
Hartman, J M Guffey & Co.....1800
Riddle, Philadelphia Co (fishing).....1000
McKee, (Oakdale) Forest Oil Co.....sand
John McConnell, P M Shannon.....drilling
Reed, Reed, Davidson & Co (fishing) sand
Elizabeth twp, Frederick & Calhoun.....1050
Wm McElheny, ".....rig
John Morrow, Raccoon Oil Co No 5 (old).....rig
East Elizabeth, East Elizabeth Oil & Gas Co (for gas).....2200
Saltsburg, J M Guffey (for gas).....drilling
" Tomlinson & Co.....drilling

Greene County, Etc.

Fordyce, E M Hukill & Co No 1 (shut down).....1360
Garard, E M Hukill & Co No 1 (shut down).....730
Garard, E M Hukill & Co No 2 (shut down).....1060
" " ".....rig
Hathaway, E M Hukill & Co No 1 (shut down).....1060
Mt. Morris, E M Hukill & Co No 1.....sand
Longanecker, " (old).....rig
Ninevah, Johnston & Hamilton.....2000
Board Tree, Wheeling Natural Gas Co.....2300
McGinnis farm, Wheeling Natural Gas Co (shut down).....1100
Sugar Grove, Wheeling Natural Gas Co (shut down).....1200
Moundsville, J W Craig & Co.....drilling
" ".....drilling
Sycamore Station, Greene Co, I Willets & Co (old).....rig
Wade P O, Ohio, Craig, Cappeau & Co.....drilling
Bethany, Hazelwood Oil Co.....drilling
Bristoria, Forest Oil Co (fishing).....1100

New rigs.....4
Old rigs and shut down.....4
Drilling.....13
Total.....21

THE PETROLEUM AGE.

AMERICAN STEAM LAUNDRY

GODFREY & HUNT., Proprietors.

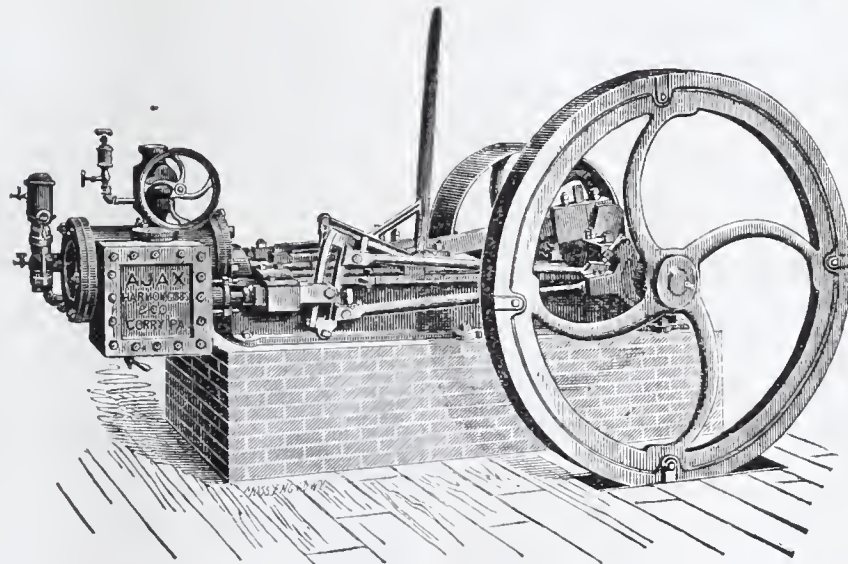
WORKS NOS. 9 TO 17 BISHOP STREET.

OFFICE 55 MAIN ST., - - - BRADFORD, PA.

TELEPHONE.


DELIVERY WAGONS.

THE AJAX ENGINE,



Manufactured by Harmon, Gibbs & Co.,

Is still the favorite in every field from the 400 feet wells of Grand Valley to the 3,000 feet wells of Washington. Economy in Fuel, Strength, Power, Speed and Durability are its strong points. Nearly 2,000 now in use, and you may travel from Wellsville, N. Y., to Macksburg, O., and not find one in a junk or repair shop.

 We finish them in the shop and do not have to follow them into the field to make them run. Record of "Ajax" No. 1105 over 22,000 feet and still drilling.

JAMES M. LAMBING, General Agent, Corry, Pa.

OFFICE OPPOSITE PASSENGER DEPOT.

SIGNIFICANT.

"As good as the **DOMESTIC**," or "like the **DOMESTIC**," is what Competitors say when speaking of the merits of their machines, and all improvements made by the **DOMESTIC** are imitated as soon and closely as possible.

Why? Did you ever think what this means? Does it not imply in the strongest manner possible the pre-eminent excellence of the

 **"DOMESTIC" SEWING MACHINE,** 

That it is the only recognized Standard and Leader in Progress?

J. W. FRITTS, Agent.

No. 7 Kennedy St., Bradford, Pa.

Buffalo, New York & Philadelphia R. R. THE NEW SHORT LINE TO SUNBURY, WILLIAMSPORT, HARRISBURG PHILADELPHIA, BALTIMORE, WASHINGTON, AND ALL POINTS SOUTH.

Leave Buffalo at 8:00 a. m. (except Sunday) arriving at Olean at 11:00 a. m. Connects at Olean for Bradford. Arriving at 12:45.
Train leaves Buffalo at 3:00 p. m. (except Sunday) arriving at Olean at 6:00 p. m., connecting at Olean for Bradford; at Port Allegany for Coudersport; at Emporium with P. & E. R. R. for Harrisburg, Philadelphia, Baltimore, Washington and the South.
Train leaves Buffalo at 5:20 p. m. (daily) arrives at Olean at 8:20 p. m.

Train for Buffalo leaves Olean at 5:45 (daily) and 10:45 a. m. (except Sunday) arriving at Buffalo at 8:40 a. m. and 1:25 p. m.
Afternoon train leaves Olean at 4:00 (except Sunday) arrives at Buffalo at 7:00 p. m.

GEO. S. GATCHELL, J. A. FELLOWS,
Gen'l. Superintendent. Gen'l. Pass and Ticket Agent.
NARROW GAUGE DIVISION, BRADFORD & OLEAN.

EASTWARD.				WESTWARD.			
Sun.	Exp.	Mail	Exp.	Eastern Time.	Exp.	Mail	Exp.
A. M.	P. M.	P. M.	A. M.	Ar. Richburg Lv	A. M.	A. M.	P. M.
7 37	7 30	7 30	7 30	" Bolivar "	5 45	9 10	2 40
11 00	6 00	3 55	8 58	" Olean "	7 20	11 00	6 05
9 15	4 15	2 15	7 15	Lv. Bradford Ar	9 00	12 45	7 50
A. M.	P. M.	P. M.	A. M.	Lv. Bradford Ar	A. M.	P. M.	P. M.

BETWEEN ELDRED AND BRADFORD.

Exp.	Exp.	Exp.	Eastern Time.	Exp.	Exp.	Exp.
P. M.	P. M.	A. M.	Ar. Eldred Lv	A. M.	A. M.	P. M.
5 10	2 55	8 30	" Duke Centre "	7 10	11 37	3 25
4 50	2 29	8 12	" Tarport "	7 28	11 53	3 51
3 55	1 16	7 15	Lv. Bradford Ar	8 25	12 50	5 09
3 50	1 10	7 10	Lv. Bradford Ar	8 30	12 55	5 15
P. M.	P. M.	A. M.	Lv. Bradford Ar	A. M.	P. M.	P. M.

80 Miles Saved by the New BRADFORD SHORT LINE,

Between Olean, Bradford, Warren and the Lower Oil Fields. Two fast Express Trains each way, daily except Sunday.

CONDENSED SCHEDULE OF THROUGH TRAINS.

EASTWARD.			WESTWARD.					
Exp.	Acc.	Exp.	Eastern Time.		Acc.	Exp.	Exp.	
P. M.	P. M.	A. M.			A. M.	A. M.	P. M.	
8 00	3 25	11 25	Ar	Bradford	Lv	7 00	9 15	4 20
6 20	12 45	9 40	Lv	Kinzua	Ar	9 15	11 00	6 00
P. M.	P. M.	A. M.			A. M.	A. M.	P. M.	
5 30		9 05	Lv	Warren	Ar		11 50	6 49
5 15		8 50	"	Irvineton	"		12 05	7 05
4 25		8 10	"	Tidionte	"		12 43	7 40
3 05		6 50	"	Oil City	"		2 05	9 45
9 00		8 50	Lv	Pittsburgh	Ar		7 25	7 25
A. M.		P. M.					P. M.	A. M.

J. A. FELLOWS, Gen. Pass. and Ticket Agent,
Buffalo, N. Y.

Buffalo, Rochester & Pittsburgh R. R. BUFFALO AND ROCHESTER DIVISION.

EASTWARD.				WESTWARD.			
P. M.	A. M.	P. M.	A. M.	Ar. Buffalo Lv	A. M.	P. M.	A. M.
7 30	6 15	11 00	" Rochester "	8 40	5 00	7 50	
3 18	2 40	8 00	Lv. Bradford Ar	12 30	8 00	11 53	
5 00	2 15	11 40	Ar do Lv	12 55	8 20	12 30	
	9 56	9 50	" Falls Creek "	4 55	5 02		
	8 40		" Punxsutawney "	6 08			
A. M.	P. M.	P. M.	Lv. Buffalo Ar				

Thousand Mile Tickets sold at Two Cents per mile.

Connections made at Salamanca with the N. Y., P. & O. R. R. for all points West and Southwest; also with the Erie R. R. for all Eastern points; at Bradford with the Narrow Gauge system to all points in the Oil Regions.

JAS. T. GARDNER, Supt. I. S. EMERY, Gen. Pass. Agt.

Warren and Farnsworth Valley Railroad.

Narrow Gauge Railroad to Garfield, Vandergrift and Dunham's Mills.
Clarendon, Lv. 10 35 5 10 Garfield, Lv. 7 20 3 15
Garfield, Ar. 11 35 6 10 Clarendon, Ar. 8 20 4 15
Trains are run on P. & E. R. R. time. Passengers can leave Oil City and Titusville for Garfield by morning train, remain three and one-half hours in Garfield and return same evening.
A. D. WOOD, General Manager.

THE ERIE NARROW GAUGE SYSTEM.

BRADFORD, BORDELL & KINZUA

AND

Bradford, Eldred & Cuba Railroad.

November 23, 1886.

WESTWARD.			STATIONS.		EASTWARD.		
Exp.	Exp.	Mail.	Ar.	Lv.	Exp.	Mail.	Exp.
A. M.	P. M.	A. M.			A. M.	P. M.	A. M.
9 25	5 15	11 15	Ar. Bradford	Lv. Kinzua Junction	7 40	3 10	7 00
8 50	4 40	10 40	" " "	" " "	8 20	3 50	7 40
8 43			" " "	" " "			7 47
8 29			" " "	" " "			8 01
7 40			Lv. Smethport	Ar. " "			8 45
	4 32	10 30	" " "	" " "	8 28	3 56	
	4 12	10 05	" " "	" " "	8 46	4 12	
	4 07	10 00	" " "	" " "	8 51	4 17	
	3 48	9 40	" " "	" " "	9 10	4 35	
	3 32	9 25	" " "	" " "	9 25	4 50	
	3 17	9 09	" " "	" " "	9 41	5 06	
	3 04	8 55	" " "	" " "	9 55	5 20	
	2 55	8 45	" " "	" " "	10 05	5 30	
	2 34	8 21	" " "	" " "	10 29	5 54	
	2 05	7 50	" " "	" " "	11 00	6 25	
A. M.	P. M.	A. M.			A. M.	P. M.	A. M.

Trains for Kane leave Bradford at 7.00 and 10.00 a. m. and 5.00 arriving at Kane at 9.30 a. m. and at 12.30 and 7.40 p. m. Trains leave Kane at 6.50 and 9.55 a. m., arriving at Bradford at 9.25 a. m. and 5.00 p. m.; arriving at Bradford at 2.45 p. m. and 5.10 p. m. arriving at Bradford at 7.55.

Additional trains leave Bradford for Smethport at 10.00 a. m. and 5.10 p. m. Returning, leave Smethport at 1.00 and 5.50 p. m.

JOHN C. MCKENNA, Superintendent.

WHEELING AND LAKE ERIE

And Cleveland and Marietta R. R.'s.

Time Table—In effect Nov. 1, 1886.

Central Standard Time.

EASTWARD.		No. 5.	No. 7.	No. 9*	No. 1*
Toledo	Lv	7 45a. m.	12 30p. m.	4 45p. m.	
Oak Harbor	Ar	8 43	1 22	5 38	
Fremont		9 07	1 47	6 02	
Clyde		9 23	2 03	6 18	
Bellevue		9 38	2 18	6 32	
Monroeville	Lv	9 57	2 32	7 01	1 35a. m.
Norwalk		10 13	2 50	7 20	1 50
Wellington		11 03	3 45	9 00	2 32
Creston	Ar	11 52	4 33	10 45	3 15
Orrville	Ar	12 20p. m.	5 05	11 45p. m.	3 45*
Orrville	Lv	12 40	5 05	6 00a. m.	6 00
Massillon	Ar	1 20	5 45	6 40	6 40
Massillon	Lv	1 20	5 45	6 40	6 40
Bowerston	Ar	2 55p. m.	7 35p. m.	9 40a. m.	9 40a. m.
Canal Dover		2 34p. m.	7 02p. m.	11 30a. m.	11 30a. m.
Newcomertown		3 13	7 46	12 09p. m.	12 09p. m.
Cambridge		4 08	8 37	1 02	1 02
Macksburg		5 39		2 30	2 30
Marietta	Ar	6 55p. m.		3 38	3 38

WESTWARD.		No. 6.	No. 8.	No. 4.	No. 2*
Marietta	Lv	7 00a. m.	11 00p. m.		
Macksburg		8 18	12 05		
Cambridge		9 52	1 27	5 30a. m.	
Newcomertown		10 47	2 20	6 20	
Canal Dover		11 30a. m.	2 54p. m.	6 55	
Bowerston		11 55a. m.	3 30p. m.	6 30a. m.	
Massillon		1 20p. m.	7 10	8 15	
Orrville	Ar	1 55	8 20	8 55	
Orrville	Lv	2 00	10 15*	8 55	
Creston	Lv	2 30	10 45	9 25	
Wellington		3 18	11 28	10 12	*
Norwalk		4 10	12 10	11 25	7 25a. m.
Monroeville		4 22	12 25a. m.	11 37	7 37
Bellevue		4 40	*	11 55	7 53
Clyde		4 56		12 10p. m.	8 08
Fremont		5 13		12 30	8 25
Oak Harbor		5 41		12 55	8 48
Toledo	Ar	6 35p. m.		1 55p. m.	9 45a. m.

No. 29.	No. 27.	NORWALK & HURON.		No. 26.	No. 28.
5 15p. m.	11 40a. m.	Ar.	Huron	6 25a. m.	2 05p. m.
4 30p. m.	10 45a. m.	Lv.	Norwalk	7 15a. m.	3 00p. m.

* Daily.

This road is now open through from Toledo to Bowerston, connecting with the Pennsylvania System for all points East.
THROUGH CAR SERVICE—Between Toledo, Cambridge and Marietta; Toledo and Bowerston; Toledo and Akron, Youngstown and Pittsburgh; Chicago, Akron, Youngstown and Pittsburgh.
M. D. WOODFORD, JAMES M. HALL,
General Manager. Gen'l. Pass. Agent

THE LIGHT RUNNING
SIMPLE NEW STRONG
HOMER
SWIFT SURE
SEWING MACHINE
HAS NO EQUAL.
PERFECT SATISFACTION
New Home Sewing Machine Co.
—ORANGE, MASS.—
30 Union Square, N. Y. Chicago, Ill. St.
Atlanta, Ga. Dallas, Tex. San Francisco, Cal.
FOR SALE BY

C. H. DUBOIS, BRADFORD, PA.

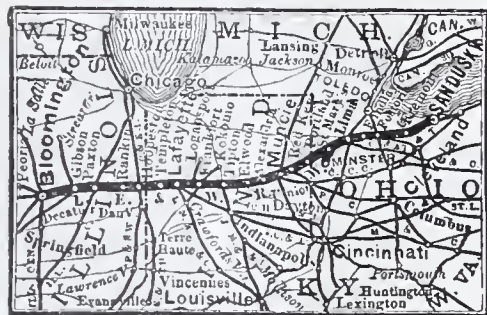
Chicago & Atlantic R. R. Co.

TIME TABLE IN EFFECT SUNDAY, JULY 11, 1886

WESTWARD.				
STATIONS.	No. 3. P. C. Ex.	No. 5. Ch. L. Ex.	No. 1. Chi. Exp.	
Marion.....Lv	10 55 p.m.	2 00 p.m.	8 25 a.m.	
Kenton.....	11 45 p.m.	2 38 p.m.	9 18 a.m.	
Preston.....			9 46 a.m.	
Lim.....	12 29 p.m.	3 16 p.m.	10 15 a.m.	
Spencerville.....			10 43 a.m.	
Decatur.....	1 47 a.m.	4 24 p.m.	11 46 a.m.	
Huntington.....Ar	2 43 a.m.	5 12 p.m.	12 50 p.m.	
Huntington.....Lv	2 48 a.m.	5 18 p.m.	1 05 p.m.	
Akron.....			2 14 p.m.	
Rochester.....	4 05 a.m.	6 27 p.m.	2 35 p.m.	
N. rth Judson.....	5 02 a.m.		3 40 p.m.	
Crown Point.....	6 02 a.m.		4 44 p.m.	
Hammon.....	6 30 a.m.	8 28 p.m.	5 40 p.m.	
Chicago.....Ar	7 00 a.m.	9 30 p.m.	6 45 p.m.	
EASTWARD.				
STATIONS.	No. 12. Atl. Ex.	No. 8. N. Y. Ex.	No. 10. Mail Ex.	
Chicago.....Lv	7 45 p.m.	4 20 p.m.	8 30 a.m.	
Hammond.....	8 48 p.m.	5 18 p.m.	9 30 a.m.	
Crown Point.....	9 16 p.m.	5 40 p.m.	10 02 a.m.	
North Judson.....	10 20 p.m.		11 25 a.m.	
Rochester.....	11 17 p.m.	7 20 p.m.	12 35 a.m.	
Akron.....	11 34 p.m.		1 00 p.m.	
Huntington.....Ar	12 45 a.m.	8 30 p.m.	2 15 p.m.	
Huntington.....Lv	12 50 a.m.	8 45 p.m.	2 30 p.m.	
Decatur.....	1 47 a.m.	9 35 p.m.	3 30 p.m.	
Spencerville.....	2 44 a.m.	10 21 p.m.	4 43 p.m.	
Lim.....	3 08 a.m.	10 40 p.m.	5 11 p.m.	
Preston.....			5 40 p.m.	
Kenton.....	4 00 a.m.	11 18 p.m.	6 08 p.m.	
Marion.....Ar	4 45 a.m.	12 07 p.m.	7 00 p.m.	

Trains run on Central Standard time.
Train 8 has Pullman Buffett Car, Chicago to New York daily, through without change
Train 12 has Pullman Buffett Sleeping Car to Boston and New York daily.
Train 3 has Pullman Buffett Sleeping Coaches from Boston and New York daily.
Train 5 has Pullman Buffett Sleeping Coaches from New York to Chicago.
All through passenger trains arrive at and depart from the new Dearborn Station, Chicago.
Passenger going East or West will find it to their advantage and interest to consult the agents of this company, who will give them all information in regard to rates and connections.
F. BROUGHTON, S. W. SNOW,
General Manager, Chicago. General Passenger Agent.

LAKE ERIE & WESTERN R'Y.



THE SHORT LINE BETWEEN THE EAST & WEST.

The shortest and most direct route, making immediate connections for passengers east and west.

CONDENSED TIME OF THROUGH TRAINS.

SEPTEMBER 20, 1886.

WESTWARD.		CENTRAL TIME.		EASTWARD	
10 15 p.m.	9 50 a.m.	Ar. Sioux City.....Lv	4 50 p.m.	7 50 a.m.	
7 40 a.m.	7 45 "	" Dubuque.....	6 30 a.m.	9 50 p.m.	
2 18 "	9 15 a.m.	Lv. Bloomington.....Ar	3 17 p.m.	8 20 a.m.	
I. B. & W. R'y					
9 20 a.m.	7 15 p.m.	Ar. Council Bluffs.....Lv	6 00 p.m.	9 10 a.m.	
8 40 p.m.	6 20 a.m.	" Burlington.....	2 35 p.m.	10 30 p.m.	
5 10 "	7 45 a.m.	" Peoria.....	7 10 p.m.	6 45 a.m.	
2 55 "	5 20 a.m.	Lv. Bloomington.....Ar	9 25 p.m.	9 10 a.m.	
C. & A. Ry					
7 10 p.m.	7 00 a.m.	Ar. Omaha.....Lv	9 05 p.m.	7 50 a.m.	
12 25 p.m.	1 00 p.m.	" St. Joseph.....	2 45 p.m.	3 00 p.m.	
11 55 a.m.	11 55 p.m.	" Atchison.....	3 15 a.m.	3 20 p.m.	
8 50 "	9 15 "	" Kansas City.....	6 00 a.m.	6 45 p.m.	
5 50 p.m.	6 30 a.m.	Lv. Bloomington.....Ar	9 00 p.m.	8 55 a.m.	
C. & A. Ry					
7 45 p.m.	7 45 a.m.	Ar. St. Louis.....Lv	7 55 p.m.	7 50 a.m.	
1 45 "	2 10 a.m.	Lv. Bloomington.....Ar	2 10 a.m.	1 45 p.m.	
L. E. & W. Ry.					
1 25 p.m.	1 35 a.m.	Ar. C. & A. Junction.....Lv	2 20 a.m.	9 20 a.m.	
1 15 "	1 25 a.m.	" Bloomington.....	2 30 "	9 30 a.m.	
11 40 a.m.	11 58 p.m.	" Gibson.....	4 02 "	10 51 a.m.	
11 02 "	11 18 "	" Paxton.....	4 38 "	11 24 a.m.	
10 10 "	10 20 "	" Hoopston.....	5 34 "	12 30 p.m.	
9 10 "	9 20 "	" Templeton.....	6 38 "	1 24 "	
8 25 "	8 25 "	" Lafayette.....	7 45 "	2 20 "	
8 04 "	8 04 "	" Lafayette Junction.....	7 52 "	2 25 "	
7 04 "	7 02 "	" Frankfort.....	8 53 "	3 16 "	
6 08 "	6 02 "	" Tipton.....	9 55 "	4 10 "	
5 36 "	5 38 "	" Elwood.....	10 21 "	4 32 "	
5 15 "	5 17 "	" Alexandria.....	10 42 "	4 51 "	
4 35 "	4 35 "	" Mendota.....	11 35 "	5 45 "	
3 46 "	3 42 "	" Red Key.....	12 15 p.m.	6 25 "	
3 18 "	3 13 "	" Portland.....	12 42 "	6 20 "	
2 14 "	2 07 "	" Celina.....	1 44 "	7 52 "	
1 50 "	1 42 "	" St. Mary.....	2 07 "	8 12 "	
12 45 "	12 45 "	Lv. Lima.....Ar	3 05 "	9 15 "	
12 35 "	12 25 "	Ar. Lima.....Lv	3 15 "	9 25 "	
12 00 p.m.	11 49 a.m.	Lv. Bluffton.....Ar	3 48 "	10 02 "	
11 21 "	11 12 a.m.	" Findlay.....	4 25 "	10 28 "	
11 00 "	10 52 a.m.	" Arcadia.....	4 46 "	11 00 "	
10 43 "	10 37 a.m.	" Fostoria.....	5 00 "	11 15 "	
10 10 "	10 07 a.m.	" Burgon.....	5 32 "	11 44 "	
9 45 "	9 45 a.m.	" Fremont.....	6 05 "	12 10 a.m.	
8 40 p.m.	8 45 a.m.	" Sandusky.....	7 00 "	1 00 "	
P. F. W. & C. Ry					
11 10 p.m.	9 50 a.m.	Ar. Lima.....Lv	4 10 p.m.	4 40 p.m.	
7 05 p.m.	10 00 a.m.	Lv. Crestline.....Ar	1 15 p.m.	7 55 p.m.	
12 40 "	11 15 p.m.	" Pittsburgh.....	5 30 a.m.	3 35 a.m.	
3 10 a.m.	3 40 p.m.	" Harrisburg.....	1 55 p.m.	3 20 p.m.	
11 30 p.m.	10 55 a.m.	" Baltimore.....	5 50 p.m.	6 50 p.m.	
11 20 "	11 50 a.m.	" Philadelphia.....	4 45 p.m.	9 35 p.m.	
8 00 p.m.	9 00 a.m.	" New York.....	6 55 p.m.	6 50 p.m.	
L. S. & M. S. Ry					
9 42 p.m.	8 40 a.m.	Ar. Sandusky.....Lv		6 05 a.m.	
6 40 "	6 30 a.m.	Lv. Fremont.....Ar	6 32 p.m.		
11 55 a.m.	11 55 p.m.	" Cleveland.....Ar	9 40 p.m.	8 25 a.m.	
2 15 "	3 00 p.m.	" Buffalo.....	3 30 a.m.	2 45 p.m.	
9 15 p.m.	10 30 a.m.	" Albany.....	2 20 p.m.	2 00 a.m.	
7 00 "	8 30 a.m.	Lv. New York.....Ar	7 00 p.m.	7 00 a.m.	
		" Boston.....Ar	9 45 p.m.	6 35 a.m.	

Through tickets on sale to all important points. For information in regard to tickets, rates, &c. inquire of Ticket Agents at principal ticket offices, or address,

G. W. SMITH,
Gen'l Pass. Agent,
BLOOMINGTON, ILL.

MAPS OF THE VARIOUS OIL FIELDS
FOR SALE BY
McMULLEN, SNEEL & ARMOR, Bradford, Pa.

First National Bank

—OF—

BRADFORD, PA.

Capital, \$150,000.

Surplus, \$30,000.

S. G. BAYNE, Pres't, J. M. FULLER, Vice-Pres't.
W. W. BELL, Cashier.

DIRECTORS:

T. W. BROWN, Vice-President Provident Life Trust Co., Philadelphia; C. M. FARRAR, of Farrar & Trefts, Buffalo; L. F. LAWTON, Cashier First National Bank, Olean, N. Y.; A. B. WALKER; F. W. DAVIS; C. C. MELVIN; J. M. FULLER; S. G. BAYNE, W. W. BELL.

STOCKHOLDERS.

Daniel O'Day, Joseph Seep, W. A. Pullman, Byron D. Hamlin, Henry Hamlin, A. G. Olmsted, L. Emery Jr., J. T. Jones, C. E. Hequembourg, L. E. Hamsher, Jno. McKeown, Robert C. Simpson, W. R. Weaver, F. D. Wood, Asher Brown, John Ley, P. L. Webster, Jos. Stettheimer, H. A. Marlin, Robert Long, I. W. Shirley, A. Hochstetter, Sheldon Jewett, P. W. Roth, James E. Blair, A. B. Smith, Kenton Saulnier, E. T. Howes, George H. Mills.

Transact general banking business. Make collections, sell drafts on Europe, and give prompt attention to all business entrusted to us at lowest rates.

Bradford National Bank

—OF—

BRADFORD, PENN'A.

Capital, \$200,000.

Surplus, \$40,000.


O. F. SCHONBLOM, Pres't. P. T. KENNEDY, Vice-Pres't.
T. H. TOMLINSON, Cashier. C. A. MITCHELL, Asst. Cashier.

DIRECTORS:

P. T. Kennedy, W. C. Kennedy, R. J. Straight
O. F. Schonblom, H. F. Whiting.

TRANSACT A GENERAL BANKING BUSINESS.


Make collections; sell drafts on Europe; buy and sell United States bonds.

 Prompt attention given to all business entrusted to us at the Lowest Rate of Charges.

PETROLEUM REAL ESTATE CO.

C. D. ANGELL,

OFFICE: 59 MAIN ST., BRADFORD, PA.

Buy, sell and lease all kinds of Oil Lands and City Property, Negotiate Contracts and do a General Commission Business.  Information carefully given. Address Lock Box 1275.

J. W. McFARLAND,

BROKER IN OIL PRODUCTION.

81 MAIN STREET.

Buys, Sells and Leases all kinds of Oil Properties. Information carefully given.

ADDRESS LOCK BOX 1925, BRADFORD, PA.

JAMES C. BOYCE,

ATTORNEY AT LAW,

Solicitor of Patents and Attorney in Patent Causes

ROOM NO. 3,

Over Oil Well Supply Company, Limited.

Corner Main and Webster streets, - - BRADFORD PA.

FOR OIL OR GAS WELL-PACKERS

SEND YOUR ORDERS TO

S. R. DRESSER, BRADFORD, PA.,

Who will fill them promptly with

The Best Malleable Iron Frame and Superior Quality of Rubber.

He Makes a Specialty of the Packer Business and Can Give You

Anything in that Line.

JOHN CONLEY,

MANUFACTURER OF

IRON, GAS AND STORAGE TANKS,

—AND—

GASOMETERS.

REPAIRING PROMPTLY ATTENDED TO

SHOP, NO. 17 GORTON STREET,

BRADFORD, PA.

THE LIGHT RUNNING

SIMPLE

STRONG

NEW

HOME

SWIFT

SURE



SEWING MACHINE

HAS NO EQUAL.

PERFECT SATISFACTION

New Home Sewing Machine Co.

—ORANGE, MASS.—

30 Union Square, N. Y. Chicago, Ill. St.

Atlanta, Ga. Dallas, Tex. San Francisco, Calif.

FOR SALE BY

C. H. DUBOIS, BRADFORD, PA.

J. W. McFARLAND,

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Corner Main and Webster streets, - - BRADFORD PA.

H. A. MARLIN & CO.,

PETROLEUM BROKERS

BRADFORD AND NEW YORK.

FOR OIL OR GAS WELL PACKERS

SEND YOUR ORDERS TO

S. R. DRESSER, BRADFORD, PA.,

Who will fill them promptly with

The Best Malleable Iron Frame and Superior Quality of Rubber.

He Makes a Specialty of the Packer Business and Can Give You

Anything in that Line.

SHENANGO & ALLEGHENY R. R.

TAKES EFFECT MONDAY, OCT. 11, 1886.

Trains are run by Standard Central Time (90th Meridian.)

NORTHWARD.			STATIONS.	SOUTHWARD.		
6	4	2		1	3	5
P. M.	P. M.	A. M.		A. M.	A. M.	P. M.
8 05	2 25	10 40	Ar.....Greenville.....Dp	6 07	11 10	3 20
7 55	2 15	10 30	.....Shenango.....	6 17	11 20	3 33
7 41	1 59	10 17	.....Kremis.....	6 29	11 31	3 44
7 31	1 47	10 08	.....Fredonia.....	6 37	11 40	3 52
7 24	1 40	10 02	.....Coolspring.....	6 42	11 45	3 56
7 23	1 38	10 01	.....Kerby Siding.....	6 43	11 46	3 57
7 12	1 26	9 50	.....Mercer.....	6 57	11 58	4 08
7 02	1 15	9 40	.....Pardoe.....	7 07	12 08	4 17
6 57	1 07	9 36	.....Filer.....	7 11	12 12	4 22
6 49	1 00	9 29	.....Grove City.....	7 19	12 22	4 28
6 46	12 55	9 26	.....Re d.....	7 20	12 24	4 30
6 35	12 40	9 16	.....Harrisville.....	7 33	12 40	4 41
6 30	12 34	9 12	.....Wick.....	7 37	12 45	4 45
6 25	12 29	9 07	.....Branchton.....	7 42	12 50	4 50
6 22	12 25	9 05	.....Coaltown Junction.....	7 44	12 52	4 52
6 19	12 22	9 03	.....Keisters.....	7 47	12 55	4 55
6 11	12 14	8 56	.....Hallston.....	7 56	1 03	5 02
6 02	12 04	8 46	.....Enclid.....	8 07	1 13	5 11
5 53	11 54	8 37	.....Jamisonville.....	8 17	1 22	5 19
5 45	11 45	8 30	.....Oneida.....	8 30	1 31	5 25
5 35	11 35	8 20	.....P. & W. Junction.....	8 40	1 42	5 35
5 25	11 30	8 15	Dp.....Butler.....Ar	8 43	1 45	5 37
3 30	9 20	6 00	Pittsburgh & Western R. R.			
P. M.	A. M.	A. M.	.....Allegheny.....	10 30	3 58	7 35
A. M.	P. M.	P. M.		A. M.	P. M.	P. M.

HILLIARD BRANCH.

10		STATIONS.	9		11
A. M.	A. M.		A. M.	P. M.	
12 00	7 30	Ar.....Branchton.....Dp	9 10	6 30	
11 50	7 20	.....Bovard.....	9 20	6 35	
11 30	6 56	.....Annandale.....	9 40	7 00	
11 20	6 48	.....Roy.....	9 50	7 10	
11 00	6 40	Dp.....Hilliard.....Ar	10 00	7 20	
A. M.	A. M.		A. M.	P. M.	

Trains 4 and 5 run daily with through coach service between Allegheny, Chautauqua Lake and Jamestown, N. Y. All other trains daily except Sunday.

I. D. STINSON, G. P. A., J. T. BLAIR, Gen. Man., Greenville, Pa. Greenville, Pa.

Baltimore & Ohio Railroad Time Table.

Depot corner Grant and Water streets, Dec. 13, 1885. Trains will arrive and depart on Eastern Standard time.

For Washington, D. C., and Baltimore, 8:35 a. m., limited, with Parlor car, and 9:20 p. m. daily.

Uniontown, 6:20 a. m., 1:10 and 4:00 p. m.

West Newton, 5:15 and 7:30 p. m.

McKeesport, 7:20, 10:15 a. m., 12:05, 3:20, 4:30, 5:50, 6:40, 9:50 and 11:45 p. m.

From Washington and Baltimore, 7:00 a. m. and 7:35 p. m., daily. Uniontown, 10:00 a. m., 2:30 and 5:45 p. m.

From West Newton, 8:30 a. m. and 11:00 p. m. McKeesport, 6:50, 7:25, 8:00, 9:00, 11:35 a. m., 1:10, 5:00, 6:20 and 8:00 p. m. Sunday trains leave 8:35 a. m., 1:00, 7:30, 9:20, 9:50 and 11:45 p. m. Arrive 7:00, 9:00, 10:20 a. m., 7:35, 7:20 and 11:00 p. m.

WHEELING AND COLUMBUS DIVISION.

For Wheeling, 6:50 and 8:40 a. m., 3:30 and 8:00 p. m.

Columbus, Cincinnati, 6:50 a. m. and 8:00 p. m. Chicago express 3:30 p. m. Washington accommodation, 5:30 p. m. Sleeping car for Columbus and Cincinnati.

From Wheeling, Columbus, Cincinnati and Chicago, 8:20 and 11:15 a. m., 4:45 and 9:40 p. m. Washington acc., 8:10 a. m.

C. K. LORD, General Passenger Agent.

B. DUNHAM, General Manager.

E. D. SMITH, Division Passenger Agent.

Philadelphia & Erie Railroad.

Time Table in Effect Nov. 15, 1886. | Eastern Standard Time.

EASTWARD.		Kane Express No. 18.	Day Express No. 8.	Erie Mail No. 4.	Kane Accom. No. 12.
Erie	Lv.	7 35 a m		2 45 p m	5 25 p m
Corry	"	9 00 "		4 13 "	7 00 "
Irvinston	"	9 52 "		5 00 "	7 50 "
Warren	"	10 08 "		5 15 "	8 05 "
Kane	Ar.	11 25 "		6 30 "	9 15 "
Kane	Lv.		6 25 a m	6 55 "	
Johnsonburg	"		6 58 "	7 30 "	
Emporium Junction	"		8 30 "	9 15 "	
Lock Haven	"		11 15 "	11 58 "	
Williamsport	"		12 25 p m	1 25 a m	
Harrisburg	Ar.		3 25 "	4 30 "	
Philadelphia	"		6 50 "	8 25 "	
WESTWARD.		Erie Accom. No. 11.	Erie Mail No. 3.	Niagara Express No. 11.	Erie Express No. 17.
Philadelphia	Lv.		11 25 p m	7 40 a m	
Harrisburg	"		3 30 a m	11 25 "	
Williamsport	"		7 10 "	2 25 p m	
Lock Haven	"		7 58 "	3 15 "	
Emporium Junction	"		10 30 "	6 25 "	
Johnsonburg	"		12 00 m	8 02 "	
Kane	Ar.		12 40 p m	8 35 "	
Kane	Lv.	6 35 a m	1 00 "		4 16 p m
Warren	"	7 45 "	1 58 "		5 25 "
Irvinston	"	7 58 "	2 09 "		5 48 "
Corry	"	8 55 "	2 56 "		6 50 "
Erie	Ar.	10 15 "	4 00 "		8 10 "

Trains daily except Sunday.

THROUGH-CAR ARRANGEMENT WESTWARD—Erie Mail—Pullman Palace Sleeping Cars Philadelphia to Erie, and Philadelphia to Williamsport (cars open to receive passengers at Philadelphia at 10 00 p m), and Washington to Williamsport. Passenger Coaches from Philadelphia to Erie, and Baltimore to Williamsport.

Niagara Express—Pullman Parlor Car Philadelphia to Williamsport.

THROUGH-CAR ARRANGEMENT EASTWARD—Day Express—Pullman Parlor Car Williamsport to Philadelphia. Passenger Coaches Kane to Philadelphia, and from Williamsport to Baltimore.

Erie Mail—Pullman Sleeper Erie to Philadelphia, and Williamsport to Philadelphia (Car open to receive passengers at Williamsport at 9 00 p m.) Passenger Coaches Erie to Philadelphia, and Williamsport to Baltimore. Sleeping Car Williamsport to Washington.

W. & W. R. R. TIME TABLE.

DECEMBER 27, 1886.

NORTHWARD		STATIONS.	SOUTHWARD	
No. 3	No. 1		No. 2	No. 4
P. M.	A. M.		A. M.	P. M.
2 00	6 00	Lv. Wayneburg	Ar. 10 35	6 25
2 15	6 15	Sycamore	10 17	6 07
2 23	6 23	Swart	10 09	5 59
2 30	6 30	Deer Lick	10 02	5 52
2 38	6 38	West Union	9 53	5 43
2 47	6 47	Dunn	9 43	5 33
2 50	6 50	Linley's Mills	9 40	5 30
3 01	7 02	West Amity	9 28	5 18
3 06	7 08	Luellen	9 22	5 12
3 11	7 13	Baker	9 17	5 07
3 14	7 20	McAcken	9 13	5 00
3 27	7 35	Vaukir	9 00	4 47
3 40	7 50	Braddock	8 48	4 33
3 55	8 05	Ar. Washington	Lv. 8 35	4 20
6 36	9 55	Ar. Pittsburg	Lv. 6 10	1 55
		P. C. & St. L. R. R.		

Time given above is Central Standard, which is 40 minutes slower than Pittsburg or local time, or one hour slower than Eastern time.

The Company reserve the right to vary from this schedule as circumstances may require. All trains daily except Sunday.

C. E. BOWER, Superintendent.

JOHN F. STRATTON,

49 Maiden Lane,

New York.



Importers, Manufacturer and Wholesale Dealer in all kinds of Musical Merchandise, Musical Boxes, Band Instruments. Stratton's Celebrated Russian Gut Violin Strings.



The PITTSBURG & WESTERN RAILROAD Time Table

NORTHERN DIVISION.

SOUTHBOUND TRAINS.

STATIONS.		25		17
		P. M.	A. M.	A. M.
Bradford	Lv.			8 15
	Lv.			
Kane				10 46
Sheffield Junction				11 40
Marienville				12 20
Tylersburg				1 00
Clarion Junction				7 00
Clarion				6 30
Shippenville	23			7 12
Knox				7 30
St. Petersburg	A. M.			8 20
Foxburg	5 40			8 50
Parker	5 50			9 00
Bruin	6 08	P. M.		9 20
Petrolia	6 18			9 32
Karns	6 22	27		9 38
Millerstown	6 36			9 55
St. Joe	6 50	A. M.		10 08
Butler	7 20	8 38		10 40
Renfrew	7 41	8 55		11 00
Callery Junction	8 10	9 20		11 25
Allegheny	10 30	10 30		12 40
	A. M.	A. M.	P. M.	P. M.

NORTHBOUND TRAINS

STATIONS.		4	8	18	24	26
		A. M.	A. M.	A. M.	P. M.	P. M.
Allegheny	Lv.	6 00	9 20	7 20	1 46	5 35
Callery Junction		7 30	10 40	8 35	3 10	6 50
Renfrew		7 58	11 00	8 55	3 34	7 12
Butler		8 20	11 20	9 16	3 55	7 33
St. Joe				9 45	4 23	8 00
Millerstown			A. M.	10 30	4 38	8 14
Karns				10 15	4 54	8 28
Petrolia			20	10 20	5 00	8 32
Bruin				10 32	5 10	8 43
Parker			A. M.	10 52	5 28	9 00
Foxburg			6 2	11 25	6 00	9 10
St. Petersburg			6 44	11 40	6 16	
Knox			7 44	12 24	7 02	
Shippenville			8 06	12 41	7 20	
Clarion Junction			8 20	12 55	7 30	P. M.
Clarion			9 00		8 00	
Tylersburg				1 30		
Marienville				2 18		
Sheffield Junction				2 50		
Kane	Ar.			3 50		
Bradford	Ar.			6 25		
		A. M.		P. M.	P. M.	

Westbound trains leave Callery Junction as follows:

Cleveland and Toledo Express 8.35 a. m., New Castle Accommodation 3 10 p. m., Chicago Express, with through Sleeping Car 4 38 p. m., Zelenople Accommodation 6.50 p. m.

No. 17 makes direct connection at Allegheny with B. & O. R. for Washington and Baltimore.

No. 19 connects at Foxburg with A. V. R. R. for Franklin and Oil City.

SUNDAY TRAINS Nos. 23 and 26 will run daily. Nos. 18 and 17 will run daily between Butler and Allegheny. No. 23 connects at Callery Junction for Allegheny and New Castle. No. 26 gets connections from Allegheny and New Castle. All other trains run daily, except Sunday.

THOS. M. KING, General Manager.

C. W. BASSETT, General Passenger Agent.

DUNKIRK, ALLEGHENY VALLEY & PITTSBURGH R.R.

Going North.		Express No. 2.	Mail No. 4.	Sunday No. 6.
Titusville, leave		7 35 a. m.	3 20 p. m.	7 35 a. m.
Grand Valley		8 03 a. m.	3 48 p. m.	8 01 a. m.
Irvinston		8 45 a. m.	4 36 p. m.	8 44 a. m.
Warren		8 58 a. m.	4 53 p. m.	8 56 a. m.
Junction		9 55 a. m.	5 45 p. m.	9 48 a. m.
Lily Dale		10 50 a. m.	6 36 p. m.	10 37 a. m.
Dunkirk, arrive		11 25 a. m.	7 10 p. m.	11 12 a. m.
Going South.		Mail No. 1.	Express No. 3.	Sunday No. 5.
Dunkirk, leave		9 25 a. m.	4 00 p. m.	2 40 p. m.
Lily Dale		10 03 a. m.	4 38 p. m.	3 14 p. m.
Junction		11 02 a. m.	5 45 p. m.	4 08 p. m.
Warren		11 55 a. m.	6 44 p. m.	5 06 p. m.
Irvinston		12 10 a. m.	7 00 p. m.	5 22 p. m.
Grand Valley		12 58 p. m.	7 49 p. m.	6 12 p. m.
Titusville, Ar.		1 20 p. m.	8 15 p. m.	6 40 p. m.

THE PETROLEUM AGE.

VOL. VI.

BRADFORD, PA., MAY, 1887.

No. 4.

RUSSIAN PETROLEUM TRADE.

REPORT OF CONSULAR AGENT CHAMBERS, OF BATOUM.

[CONTINUED FROM PAGE 1611.]

HANDLING THE CRUDE OIL.

IRON tanks for crude oil are but seldom used, as is also iron pipe for conducting the crude from wells to reservoirs. Instead of iron pipe, wooden box troughs or dirt ditches are used for the latter purpose, and reservoirs are made by excavating the ground in the vicinity of the well, or by simply throwing up walls with the sand that has been thrown out of the wells. Of course there is a loss from the ground absorbing the crude, but the price is so low that this loss is insignificant. From the reservoirs the crude is pumped through pipes to the refineries, which are located on the sea shore, about two miles east of Baku, at Chornai-Gorod (Black Town).

The specific gravity of Balakhani crude oil varies, but not sufficiently to make any difference in its value, so that it is all run together, forming a crude of about 0.865 specific gravity, or 32° Beaume. It contains no paraffine, and very little benzine is made from it, none of which is lighter than 0.700 specific gravity. As I have said before, I think it exceedingly probable that the crude will be of less specific gravity as the drilling deepens, as I find the oil from Nobels' No. 32 about 0.850 specific, or 34½° Beaume.

The distance from the wells to refineries is about 8 miles, and as the average elevation of the wells above the Caspian Sea is 175 feet, the piping of the crude is not at all difficult. There are now 14 pipe lines, from 3 to 6 inches in diameter, and belonging to thirteen different owners. The pumps used are either of American manufacture or made in England or Russia from American patterns, with the knowledge and consent of the American manufacturers and patentees. The latter, I am informed by men of experience with both kinds, are by no means as good as those made in America, and I have heard surprise expressed at the American manufacturers allowing their machinery to be so indifferently constructed in England and Russia.

The aggregate daily capacity of the fourteen pipe lines is about 100,000 barrels. The nominal pipeage charge is 1 kopeck per pood (about 4 cents per barrel), but the pipe lines are generally owned in connection with both wells and refineries.

PRICE OF CRUDE OIL.

The following figures, although not very complete, will give some idea of the prices for crude at wells per barrel of 42 gallons in the past five years:

Date	Price, Cents.
January and February, 1881.....	12 3-5
April to June, 1881.....	7 7-20
July, 1881.....	6 3-10 to 10½
August, 1881.....	9 9-20 to 12 3-5
September to December, 1881.....	8 2-5 to 12 3-5
January to March, 1882.....	12 3-5

Date.	Price, Cents.
April to October, 1882.....	10½ to 12 3-5
November to December, 1882.....	8 2-5
January to March, 1883.....	8 2-5
April to July, 1883.....	4 1-5 to 8½
August to November, 1883.....	2 1-10 to 6 3-10
February to March, 1884.....	4 1-5 to 7 7-20
April and May, 1884.....	7 7-20 to 8 2-5
June, 1884.....	14 7-10
July and August, 1884.....	16 4-5
September, 1884.....	14 7-10 to 16 4-5
October to December, 1884.....	9 9-20 to 10½
January, 1885.....	8 2-5 to 10½
February, 1885.....	14 7-10
March and April, 1885.....	16 4-5
May and June, 1885.....	12 3-5 to 16 4-5
July, 1885.....	16 4-5
September, 1885.....	10½
October to December, 1885.....	8 2-5 to 4 1-5
January to March, 1886.....	3 3-20 to 4 1-5
April to June, 1886.....	8 2-5 to 10½

The price of crude oil at wells at present is variously quoted at from 2 1-10 cents per barrel, with no buyers, to 8 2-5 cents, and a good demand. Some sales have recently been made for next year's delivery at prices as low as 4 cents per barrel at wells. It is always difficult to quote a price for either crude or refined, as there is no regular market, and a transaction can never be called closed until the oil and money have actually changed hands. The prices are always governed by the financial necessities of the parties to the transactions, and consequently a wide difference in the prices at which different transactions are made at the same hour is often noticeable. Contracts for future delivery are common, but very uncertain, as it requires great care and knowledge of Russian law to make such contracts binding. It is not an uncommon thing to hear of some of the heaviest dealers declining to fulfill a contract because of a very small difference against them, and the majority of the smaller dealers always refuse to fulfill a contract when the difference is against them, if there is any chance to get out of it.

TEST WELLS OR EXPERIMENTAL BORINGS.

Americans familiar with the business of petroleum production will undoubtedly be surprised to know that no important efforts have yet been made to extend this apparently small field, *i. e.*, that very little test well drilling, or "wildcatting," as it is called in America, has been done. From the fact that oil in profitable quantities is found at Bibi-Eibat, eleven miles south of Balakhani, it is a reasonable deduction that oil may also be found between the two points, but until now no efforts have been made to practically demonstrate the correctness of this theory. West of Balakhani from five to eight miles some wells have been drilled, but not deep enough to be of any use as a test of the territory, and southeast at a place called Zikh. The Nobel Bros. are now drilling a well which is nearly 2000 feet deep. The country surrounding Balakhani, upon the surface, certainly shows as favorably for petroleum as does that district itself. Six or seven miles southeast is Surakhani, the location of a very ancient monastery of the fire worshipers of India, a building now in ruins, but which is yet occasionally occupied by a few of these religious enthusiasts, who make a long and weary pilgrimage on foot from India to do homage at the shrine

of everlasting fire, which is merely a small jet of natural gas, now almost extinct. At this place a little petroleum was formerly produced, and natural gas has escaped from fissures in the earth for centuries. The supply of natural gas here is greatly reduced now, of course, but for years the refinery at Surakhani used it for fuel, and is still burning a little.

West of Balakhani are large salt lakes in winter, but which in summer are dry, and surrounding which are broken ranges of hills from 50 to 250 feet in height. A number of these hills are known as mud volcanoes, from the fact that at some time in the past they were in a state of eruption, and threw out great quantities of mud. The evidences of these eruptions are still visible, consisting of mud, covering the hillsides, but no eruption has occurred in the last nine years.

The Russian producers explain their apparent lack of faith and energy in not seeking fresh territory by pointing to the self-evident facts that they have now more oil than they know what to do with, and that the sure territory is by no means exhausted. From my own observation I believe they have yet sufficient space within developed lines for 500 or 600 more wells. At the last congress of the petroleum interests, held at Baku (March, 1886), preparations were talked of for future experimental borings, and I am informed that several test wells will soon be started at some distance west of Balakhani. It is proper to add here that some dry holes, or very small wells, have been drilled within the lines of what is called sure oil producing territory, but these, of course, were exceptions, and the territory inside of these lines is reasonably sure.

THE REFINERIES.

The refineries, with the exception of three, one at Bibi-Eibat, one at Surakhani, and one in the town of Baku, (the latter having been idle for some months owing to the financial difficulties of its owners), are all located at Chornai-Gorod, are exceedingly numerous, and of every description and capacity, from the immense modern works of Nobel Bros., capable of turning out 6000 barrels of refined oil every twenty-four hours, down to the primitive 10-barrel still, inclosed in a little stone hut, of the Tartar refiner. The total number of refineries is generally said to be more than two hundred, but the statisticians seem to consider only about 136 as worth mentioning, as follows:

	No.	Stills.	Daily capacity. Gallons.
Large refineries.....	12	216	747,500
Smaller	15	115	159,050
Small	109	210	315,000
Total.....	136	541	1,221,550

In the official returns for the year 1885 only 87 refineries are mentioned, as follows. Production of refineries in gallons:

	No.	Refined oil.	Lubricating.	Ben-zine.	Total.
Large refineries.....	10	123,898,430	7,337,500	205,000	131,440,930
Small.....	77	36,598,635	2,675,000	-----	39,273,635
Totals.....	87	160,497,065	10,012,500	205,000	170,714,565

The following are the official figures for the actual output of petroleum products from Baku for the last five years (in gallons):

	1881.	1882.	1883.	1884.	1885.
Refined	58,171,425	62,898,860	59,639,400	108,609,855	131,613,925
Other pr'd'cts.	59,467,110	99,498,910	85,541,305	154,511,855	174,637,070

Total.....117,638,535 162,397,770 145,180,705 263,121,710 306,250,995

Of the above the following amounts were exported, 1883, 1,934,670 gallons; 1884, 25,284,720 gallons; 1885, 35,000,000 gallons.

The estimate given of the capacity of the 136 refineries is no doubt reasonably correct. Owing, however, to the numerous holidays in Russia, and the impossibility of doing anything for several months in the winter, for

causes already explained, the maximum annual capacity of these refineries would hardly be more than two hundred times their maximum daily capacity, as two hundred working days in the year is a fair estimate for this country. This shows an abundance of refining capacity, as the product of the refineries in 1885 was not more than half of this estimate.

METHODS OF REFINING AND PRODUCT.

The method of refining petroleum at Chornai-Gorod is substantially the same as in America. Smaller stills are used than are used in America, and they can be "run" oftener. The stills used in the more modern works are generally of about 125 barrels (42 gallons) capacity, and with this size still three or four runs every twenty-four hours can be made, as only 25 to 35 per cent. is run off, the residuum being fluid and easily run out of these stills into smaller ones, from which another distillate is taken off for solar and lubricating oils, consequently there is no necessity of cleaning the stills after every run, and they last for years. The cleaning and deodorizing of the distillate is done in the American manner, but requires more chemicals than the American distillate.

The average yield in merchantable products of Russian crude petroleum is very difficult to ascertain, every refiner obtaining, apparently, different results, and very few refiners keeping accurate records of those results; consequently I can only take the figures at which numerous contracts have been made for an average, *i. e.*, $3\frac{1}{2}$ poods of crude for 1 pood of refined, or about 28½ to 29 per cent. Nobel Bros. claim to be able to take 35 per cent. illuminant from the crude, and say they can get a still greater yield, but the expense will not justify it at present prices for crude. But Nobels are always experimenting, with the assistance of able chemists, and I am sure no other refiner gets such a large yield of refined oil from the crude.

TEST.

There is no legal fire test for refined petroleum in Russia, consequently the refiners make just such goods as they find most profitable, and many of them, in fact almost all of the smaller refiners, find it profitable to make very bad oil. Russian bad oil, however, differs materially from American oil of an inferior quality, because it can be handled without danger, as the higher the fire test the greater the yield of so-called illuminant. Refiners working for present profits only, make generally a very high fire test refined, some of it so high that it cannot be burned in an ordinary lamp. The larger refiners whose interests are of sufficient importance to make them look forward to establishing a permanent business, and consequently a good reputation for their products, adopted some years ago, by mutual agreement, the standard test of 25° C., or about 76° F., for their illuminating oil, believing that to be a sufficiently high test for safety and good burning qualities. Lamps for burning Russian refined have been greatly improved in the past few years, and it is now thought that a higher test oil can be used. Consequently in March last the Russian authorities notified the Baku refiners that after a date to be thereafter fixed all refined must be made 28° C. fire test, but the date for this to take effect has not been fixed up to the present time.

I have been unable to ascertain the exact wording of this order regarding fire test, and cannot be sure if it is intended to provide against a higher or lower test than 28° C. (about 81° F.) Without a provision against a much higher test than 28° C. it seems as if little protection against bad refined would be gained. There would

apparently be no object in making a lower test refined from a crude of 0.865 specific gravity, yielding less than 1 per cent. of benzine (spec. 0.690). Only a few weeks ago a leading refiner declared in my hearing that he would prefer a test of 50° C. to 28°.

QUALITY OF THE OIL.

Even here in Russia there is a great difference of opinion as to the relative merits of Russian and American illuminating oil, and while it is not generally asserted that the Russian refined can be made as good an illuminant as the American, there is no doubt that it can and is made to burn quite good enough for all purposes, and emits no disagreeable odor while burning.

After taking from Russian crude oil, say 30 per cent. illuminating distillate, about 15 per cent. is taken from the residuum, which is called "solar oil," and which, although a nice looking white oil, is too high fire test to burn in ordinary lamps, and not sufficiently good for lubricating purposes. This is generally mixed with the "astatki," or crude residuum, although the last Baku congress of petroleum people "Resolved that its use should be made compulsory for the purpose of lighting public buildings, theatres, circuses, hotels, etc., that the use of kerosene (refined) should be prohibited in such buildings, and that the ordinary restrictions applied to mineral oils in transportation, storage, etc., should be taken off solar oil, and it placed in the same category with vegetable oils." This is, however, only a petroleum producer's resolution, which will be understood no doubt in America. After the solar oil is taken, the lubricating oil distillate is taken off, and varies from 20 per cent. to 25 per cent. From this distillate a very good lubricant is made, as it is affected neither by intense heat nor great cold. The lubricating oil is made in Baku, but great quantities of the distillate are also shipped to England, France, Belgium and Germany, and there purified and made into lubricating oils. After the foregoing proportions are taken from the crude, the residuum, down to about 15 per cent. of the whole is taken off, and generally mixed with the solar oil. This is called "astatki" or crude residuum, and is the fuel of Southeastern Russia. As the Caspian and Volga steamers, many of the railways in Eastern Russia, and the Transcaucasian Railway use it for fuel, there is a great demand for it, and it sells at an average price of 1-10 cent per gallon free on board cars or steamers at Baku. The 15 per cent. left in the still is called "mazoot," and, as it will not burn, is a total waste. A few years ago it was used in limited quantities to sprinkle the streets of Baku, which was a very good idea from a sanitary point of view.

Estimated as above, the yield of Russian crude in merchantable products is about 85 per cent., as follows:

	Per cent.
Illuminating oil.....	30
Lubricating oil.....	20
Solar oil.....	35
Astatki (crude residuum) }	
Waste.....	15
Total.....	100

MARKETING OIL.

The great market for Russian petroleum is of course Russia itself, where it is protected from American competition by a prohibitory tariff. The Russian markets are reached principally by water transportation, via Caspian Sea and Volga river, to the eastern termini of the Russian railways, and thence by railway. Barrels were formerly used for the transportation; several barrel factories were erected at Baku and one at Tsaritzin on the Volga. The machinery in these factories is principally of German manufacture, and when made

was probably as good as any in America. Now, however, it is not up to the American machinery for the same purpose. Labor was, however, cheaper than steam, and the steam barrel works were a failure. Timber for barrels was always expensive, and the increased demand which came with the increased production made some other method of transportation absolutely necessary, and the result was the construction for Nobel Bros., in Sweden, of a steamer to carry petroleum in bulk, which proved a great success, and completely did away with the use of barrels in the Baku trade. Nobels now have thirteen of these steamers in service, carrying from 4000 to 6000 barrels each, all of which were constructed in Sweden and brought from the Baltic Sea via canal to the Volga river. The short locks in the canal necessitate the steamers being constructed so as to be taken through in two pieces and again joined together when the Volga is reached. This method of getting the steamers to the Caspian is of course very tedious and expensive, notwithstanding which there is now a large fleet of them in service.

The petroleum products are carried in these bulk steamers to a point at the mouth of the Volga river called "Davit Foot" (meaning nine feet of water), about 400 miles north of Baku and 90 miles from Astrakhan, where they are transferred into barges which are towed by small steam tug boats to the various distributing points on the Volga, where tanks have been constructed for the reception and arrangements made for railway shipments. The chief distributing point upon the Volga is Tsaritzin, about 350 miles from Astrakhan, but there is also tankage at Saratof, Kazan, and Nijni-Novgorod. From these points it is distributed all over Russia in tank cars. Some is also exported to Germany via Riga and Libau (by sea), Eidtkunen by railway, and to Austria via Warsaw and Brody and Pod Volochisk. Owing to the gauge of the Russian railway system being five feet, while that of the continental railway system is the "standard" gauge, another transfer of the oil must be made at Eidtkunen for Germany, and at Warsaw, Brody and Pod Volochisk for Austria.

The number of tank cars in service upon Russian railways north of the Caucasus is 2500, or was a few months ago, as the number is constantly being increased. The tank car is of the same style as the modern American tanks, but of uniform size and capacity, holding, nominally, 600 poods, although usually taking 660 poods or about 3300 gallons.

Previous to the year 1883 all petroleum products were shipped from Baku by water. In that year the completion of the Transcaucasian Railway provided another outlet via railway to the Black Sea. Two ports on the Black Sea, Poti and Batoum, were available for the export trade, but Batoum was selected by this trade because of the superiority of its harbor and the advantage of its being a free port. The railway company provided tank cars to the number of 475 in 1883, and iron tanks were erected at Batoum. A can and case manufactory, with a capacity of about 7000 cans and 3500 cases per day, was erected by a large refiner of and dealer in Russian oil, the machinery necessary, together with the workmen to put it in running order, coming from America. Others also started to manufacture cans and cases by hand, and the business increased so rapidly that in 1884 and 1885 the railway company added 750 more tank cars to its rolling stock, and will, I understand, put on a number of new tank cars this year. Owing to the high price of American petroleum in the Levant during the years 1884 and 1885 the Batoum

dealers had a large and increasing business at good profits in the Levantine ports. In January, this year, the Russian Transportation and Trading Company brought from Sweden, where it was constructed, a large steamer to carry oil in bulk between Batoum, Odessa and other Russian ports. This steamer carries about 550,000 gallons, and in the same month another steamer of about the same size took her first cargo of oil in bulk to Antwerp, having been chartered for three years for the trade between Batoum and Antwerp. Since then three more English built bulk carrying steamers, taking about 600,000 gallons each, have taken cargoes to Trieste, Fiume and Hamburg. One other smaller steamer will be here in a few days, which will make the total number in the trade at present six, with a carrying capacity (to the ports for which they are chartered) of 50,000,000 gallons per year. It is said that by the 1st of January next there will be three more bulk carrying steamers here for cargo, which will add about 15,000,000 gallons to the bulk carrying capacity.

PROSPECTS OF THE INDUSTRY.

The outlook for the Batoum trade in the early spring of the present year was very favorable. The scarcity of money and the consequent high rate of interest (money is always worth 20 per cent. per annum at Baku, and as high as 50 per cent., it is said, has been paid, and the security must be perfectly good to get it at any rate of interest) had caused a crisis in the trade at Baku, and the prices for both crude and refined oil declined to almost nothing. The price of crude for several months was quoted at $2\frac{1}{2}$ cents per barrel with no buyers, while refined was sold as low as three-fourths to 1 cent per gallon free on board Baku. Sea and ocean freights were also very low, and this combination of circumstances made it appear almost a certainty that the Russian refined would drive the American article out of the Levant market in a very short time, and eventually out of many European markets. But, unfortunately for the Batoum trade, this bright outlook was of short duration. In April, in the Levantine markets, which the Batoum people, owing to their proximity, looked upon as wholly their own, the prices of American refined began to decline in sympathy, no doubt, with the declining price of crude in America. At about the same time prices at Baku commenced to advance, owing to the increased demand after the Volga navigation opened. These circumstances did not seem to check the trade here. The railway was pushed to its utmost capacity, new tankage was erected (the total amount of tankage at this port is now about 24,000,000 gallons), pipe lines were laid to load bulk steamers, the port was crowded with vessels, chartered at ruinously low rates to owners, and until July no decline in the volume of the business was perceptible.

In July came the imperial ukase abolishing the free port at Batoum, making Batoum a regular Russian port, to enter which all imports must pay the high Russian tariff. This was undoubtedly a blow for the can and case industry, as all tin plate used in the manufacture of cans is imported, and the duty upon it almost doubles its cost at Batoum. The Russian authorities intimated that the duty paid upon tin plate would be refunded, when the tin was exported in the shape of petroleum cans, but up until October no arrangement was made for this purpose. In that month the matter was arranged by the Custom House authorities opening an account current with importers, charging them with duty on tin imported, and crediting them with the amount when the tin is ex-

ported in the shape of petroleum cans, the importers depositing Russian gold bonds with the Custom House authorities to secure the credit thus given them. As only gold bonds are accepted by the Custom House, this necessitates a great increase of capital, which it is impossible for many of the small manufacturers to procure. The large can and case factory here has been bought by the Paris Rothschilds, and as they do not lack capital, it is generally believed that they, with perhaps one or two other large dealers, will eventually monopolize the case trade here. At present, while prices are not so high at Baku as in summer, they are fully as high here, because of the limited transportation facilities of the railway. Sea and ocean freights have advanced, and the American prices continue very low in the Levant. These circumstances, together with the increased demand for refined for tank steamer shipments have caused a great reduction of the case trade in the last two months, and although this trade is now showing signs of improvement, its future does not look particularly bright, from a Russian standpoint. Notwithstanding it is freely admitted that there has been no profit in tank steamer shipment thus far, new steamers, as I have before shown, are coming into this trade. It will require at least 75,000,000 gallons next year to keep the tank steamers that will then be in this trade profitably employed. In addition to this, the demand for oil for case shipment will certainly increase.

In 1885, as will be seen by statistics annexed, the export from this port was over 31,000,000 gallons, without tank steamers, principally in cases, and shipments to Russian ports were about 8,000,000 gallons more. Therefore it is presumable that the demand at Batoum next year will be considerably over 100,000,000 gallons, and as the maximum carrying capacity of the railways is not over 70,000,000 gallons per year, it seems very clear that the tank steamer business is already overdone, and that these steamers must either monopolize the trade to the exclusion of the case trade or incur heavy loss. There is not the slightest doubt that this new feature in the business will be, if it is not already, greatly overdone, nor is there any doubt that in overdoing it they will flood the European markets with Russian oil, which they will undoubtedly be compelled to sell at a loss, and thus work great injury to the American trade. With these people the question of competing profitably with American petroleum does not seem to be considered. They simply continue the competition until their money and credit are gone, and at present it appears that both their money and credit are at a very low stage. The unfortunate financial condition of the trade is made the subject of much newspaper writing, and petitions of all sorts are sent to the Government asking for assistance in numerous ways. Of course, little attention is paid to these appeals for alms, and it is not at all likely that the Government will assist people who have shown themselves so utterly incapable of taking care of their own affairs as these people. Their only hope, and at the same time their greatest fear, seems to be a monopoly of the business by some great capitalists, presumably the Rothschilds. It is very safe to say that a monopoly of this business will be very difficult to acquire, and at the first attempt at anything of the kind a wail, loud and deep, will go up to St. Petersburg for protection against it.

[TO BE CONTINUED.]

THE price of Lima oil has been reduced to $27\frac{1}{2}$ cents per barrel.

OIL REGION CHRONOLOGY.

FOR APRIL, 1887.

April 1.—AGE oil report shows 133 wells completed in March, of which 44 are dry; new production, 3787 barrels; new rigs, 80; old rigs, 122; wells drilling, 163; total field operations, 365; increase over February, 7. Lima reports 20 wells completed in March, with 424 wells completed to April 1st, a daily production of 10,318 barrels. Pipe lines report 283 wells at Lima, 81 at Findlay and 8 at North Baltimore, producing oil from Trenton rock. Market opened at 63 $\frac{3}{8}$ c, firmed up to 63 $\frac{5}{8}$ c, sagged off and closed offered at 63 $\frac{3}{8}$ c, with 63 $\frac{1}{4}$ c bid. Carrying rates—Bradford, Oil City and Pittsburgh, 45c to 50c; New York, 55c. Washington production 7002 barrels from 165 wells. Two wells shot during the week. Petrolia producers endorse the Billingsley bill.

April 2.—Market opened steady at 63 $\frac{3}{8}$ c and closed at 63 $\frac{5}{8}$ c bid. Reibold production 3351 barrels from 46 wells. Breakneck well, on Goering farm, through sand and dry. Phillip Morrissey, of Oil City, accidentally shot by Fred Miller.

April 3.—Sunday. McInerny's hotel, Salamanca, destroyed by fire.

April 4.—Market opened at 63 $\frac{5}{8}$ c and close at 63 $\frac{1}{2}$ c bid. Certificates reported more plentiful in the Exchanges and carrying rates are stronger. Washington—Fergus, No. 2, drops off to 12 barrels an hour. Acme refinery, at Olean, orders a temporary shut down. Mayor Dempsey takes charge of the Bradford city government, and N. J. Stanton is made chief of police.

April 5.—Market opened at 63 $\frac{1}{2}$ c, and remained at this figures until 2:30 p. m., when it suddenly advanced to 65 $\frac{5}{8}$ c, broke to 65 $\frac{1}{4}$ c, reacted to 66c, weakened and closed at 65 $\frac{5}{8}$ c bid. Carrying rates—Bradford and Pittsburgh, 50c; Oil City, 45c; New York, 60c. Citizens' G. & O. Co.'s well, on McKenan farm, Washington, through Gordon sand with no oil nor gas. Billingsly bill, which was to have come before the Legislature today, postponed another week.

April 6.—Market opened at 65 $\frac{3}{8}$ c, broke to 64 $\frac{3}{4}$ c, reacted to 65 $\frac{1}{2}$ c, sold off to 64c and closed at 64 $\frac{1}{8}$ c. Carrying rates 45c to 60c. Washington—McKeown, Martin, No. 1, four bits in sand and flowing by heads. Representative Johnson hung in effigy on the Public Square, Bradford, for his action in refusing to vote for calling up the Billingsley bill.

April 7.—Market opened at 64 $\frac{1}{4}$ c, sold off to 64c, advanced 64 $\frac{1}{2}$ c and closed at 64 $\frac{3}{8}$ c. Washington—McKeown, Martin, No. 1, doing 18 barrels an hour; Morgan, No. 9, making 200 barrels a day. Residence of Alfred Taylor burned at Oil City. C. P. Henry dies at Warren from effects of being thrown from his carriage the 21st of February.

April 8.—Good Friday. No market. Reibold production 3246 barrels from 48 wells. Morse, Collins & Heasley's No. 9, White, at Kinzua Village, made 175 barrels first twelve hours, and then increased to 43 barrels an hour. A huge gasser struck near Bowling Green, Ohio. Tiffin, O., celebrates arrival of natural gas from Findlay. Strong flow of natural gas struck at Jonesboro, Indiana. Lima oil successfully used for firing a locomotive at Meadville. Bursting of gigantic naphtha fountain reported from Baku, Russia.

April 9.—Market opened at 64 $\frac{1}{4}$ c, advanced until 66 $\frac{1}{4}$ c was reached and closed at 65 $\frac{5}{8}$ c. Washington production 6791 barrels from 168 wells. Fire at Bear Creek Oil Refinery, Coleman Station, near Pittsburgh; loss, \$5000.

Oil City Exchange adopts a resolution favoring passage of the Billingsley bill by a vote of 64 to 32. Chester Green, a Bradford driller, shot and instantly killed by A. R. Catlin, at Jamestown, while attempting a burglary at Catlin's house. Bradford Fire Police dissolved after an existence of nine years.

April 10.—Easter Sunday. Reibold—Burchfield Oil Company's No. 1, Behm farm, three-quarters of a mile ahead of present developments, starts at 12 barrels an hour. Phillips, No. 1, on the Newmarket farm, in upper pay streak and making 45 barrels an hour.

April 11.—Market opened at 65 $\frac{3}{8}$ c, sold off to 64 $\frac{3}{8}$ c, reacted to 64 $\frac{7}{8}$ c and closed with sales at 64 $\frac{1}{2}$ c. Carrying rates—Bradford and Oil City, 50c; New York, 60c; Pittsburgh, 45c. Reibold—Phillips, Markle, No. 7, or Z. Markle, No. 1, starts at 70 barrels an hour. Case of infanticide discovered at Tarport. Mrs. Rachael Palmer the alleged guilty party. Bradford Oil Exchange adopts resolutions favoring the Billingsley bill. Large delegation of Bradford producers leave for Harrisburg.

April 12.—Market opened weak at 64 $\frac{1}{4}$ c, declined to 64 $\frac{1}{8}$ c, and then with numerous fluctuations advanced to 65 $\frac{5}{8}$ c and closed at 64 $\frac{3}{8}$ c. Reibold—Burchfield well, Behm farm, strikes a pay streak and increases to 30 barrels an hour; Phillips Bros., No. 7, Markle, doing 70 barrels an hour. Billingsley bill passed third reading by a vote of 132 to 39.

April 13.—Market opened steady at 64 $\frac{3}{8}$ c, receded to 64 $\frac{1}{4}$ c, advanced to 64 $\frac{7}{8}$ c and closed at 64 $\frac{3}{8}$ c. Reibold—Burchfield well, Behm farm, increased to 50 barrels an hour. Field production 6350 barrels. Small fire at Independent refinery, Oil City.

April 14.—Market opened at 64 $\frac{1}{2}$ c, advanced slowly to 64 $\frac{3}{4}$ c and closed at 64 $\frac{3}{8}$ c. Reibold—Burchfield well 72 barrels an hour; Phillips, Markle, No. 7, agitated and increased to 78 barrels an hour. Washington—Chartiers Oil Company's well, ou McNary farm, through the "fifty-foot" without oil. Burglars blow open a safe in J. T. Graham's grocery, Tarport, and secure only seven dollars in cash.

April 15.—Market opened at 64 $\frac{1}{2}$ c, with a few sales at 64 $\frac{3}{8}$ c and closed at 64 $\frac{1}{2}$ c. Carrying rates 45c to 60c. Washington—Davis, No. 7, shot and started at 60 barrels an hour. Reibold—Burchfield well 65 barrels an hour. Alvin Culver found dead, hanging to a tree, near Tylersburg, Clarion county.

April 16.—Market opened at 64 $\frac{1}{2}$ c, advanced to 64 $\frac{3}{4}$ c and closed at 64 $\frac{1}{2}$ c. Carrying rates 45c to 60c. Washington production 7978 barrels from 172 wells, including the four wells at Taylorstown, which gauge 572 barrels. Davis, No. 7, 60 barrels an hour. Reibold gauge 4962 barrels from 50 wells. A six-year-old daughter of Casper Yaugh, of Petrolia, Butler county, fatally burned by her dress taking fire from a burning brush heap.

April 17.—Sunday. Reibold—Phillips Bros., Markle, No. 7, doing 40 barrels an hour; Burchfield, on Behm, 40 barrels an hour. Washington—McKeown, Martin, No. 4, 35 barrels an hour.

April 18.—Market opened at 64 $\frac{1}{2}$ c, sold off to 63c and closed at 63 $\frac{1}{4}$ c. Washington—Davis, No. 6, 17 feet in sand and doing 44 barrels an hour. Heavy fall of snow throughout the oil country.

April 19.—Market opened at 63 $\frac{3}{8}$ c, advanced to 63 $\frac{5}{8}$ c, sold off to 62 $\frac{7}{8}$ c and closed at 63 $\frac{3}{8}$ c. Washington—Davis, No. 7, 60 barrels an hour.

April 20.—Market opened at 63 $\frac{3}{8}$ c, advanced slowly to 64 $\frac{1}{2}$ c, weakened to 62 $\frac{3}{8}$ c and closed at 62 $\frac{3}{4}$ c. Leech well, at Taylorstown, reported through the sand and a

heavy gasser. McKeown, Martin, No. 4, doing 840 barrels a day. Davis, No. 7, 1100 barrels a day. Billingsley bill, with a few amendments, reported favorably to the Senate.

April 21.—Market opened at 63c, moved up to 63¼c, fell back and closed at 63c. Carrying rates—New York, 60c; Oil City, Pittsburgh and Bradford, 50c. Washington—Smith, No. 4, starts at 12 barrels an hour from top of "50-foot;" Morgan, No. 9, through sand and doing 150 barrels a day. Reibold—Phillips, Markle, No. 9, starts at 150 barrels an hour and bursts the casing. Rider's hardware store, at Franklin, destroyed by fire; loss, \$35,000.

April 22.—Market opened at 63c, sold off and closed at 62¾c. Reibold—Production of pool 7306 barrels from 54 wells. Burchfield, on Behm, 35 barrels an hour; Phillips, Markle, No. 9, 130 barrels an hour in morning and 100 barrels in the evening. Well at Knob run, Marshall county, W. Va., reported showing oil.

April 23.—Market opened steady at 63c, advanced to 63½c and closed at 63¾c bid. Washington field production 8104 barrels from 174 wells. Davis, No. 7, making 900 barrels a day; Smith, No. 4, drilling in 50 foot, produced 249 barrels last twenty-four hours. Reibold—Markle, No. 9, 86; No. 7, 42 barrels an hour.

April 24.—Sunday.

April 25.—Market opened at 63¾c, advanced to 63¼c and closed at 63½c. Reibold—Markle, No. 9, 62 barrels an hour. Billingsley bill passes first reading in the Senate.

April 26.—Market opened at 63½c, advanced to 63¾c, sold off to 63½c, advanced to 64c, fluctuated between 63¾c and 64½c and closed at 64½c. Washington—B. B. Campbell, Wade, No. 2, in second pay streak and doing 60 barrels an hour. C. B. Post killed at Titusville by a kick from a horse. King, the Clarion county murderer, found guilty of murder in the first degree. Bradford committee leaves for Harrisburg to urge passage of the Billingsley bill. Billingsley bill passes second reading in the Senate. Coal train of forty cars wrecked on the Erie Railroad at Big Shanty. Two men seriously hurt and twenty-eight cars smashed to pieces. Natural gas explosion causes a fire which destroys Willis Bros' grocery at Allegheny City, and causes death of two clerks, besides injuring several other persons. Notice given that a premium of 17½c per barrel will be paid for Grand Valley oil.

April 27.—Market opened at 64c, advanced to 65½c and closed at 64¾c bid. Washington—Campbell's No. 2, on Wade, 50 barrels an hour. Charles McMullen, a Washington driller, commits suicide by cutting his throat.

April 28.—Market opened at 65½c, advanced to 65¾c, declined to 65½c, reacted to 67¾c, weakened to 66½c, boomed to 68¼c and closed at 67½c bid. The Billingsley bill defeated in the Senate by a vote of 25 to 18. Washington—Campbell's, Wade, No. 2, 45 barrels an hour. Producers hold a meeting at Harrisburg and resolve to form co-operative refineries and pipe line companies. Steamer Ben Hope burned off the coast of Georgia with 115,000 gallons crude petroleum cargo.

April 29.—Market opened at 67½c, moved up to 67¾c, sold off to 67½c, then advanced to 68½c, receded to 68¼c and rallied to 68¾c, the highest point of the day. It fluctuated between this figure and 67½c up to 2 p. m., at which time 68¼c was bid. During the closing hour it fell off to 67¾c, advanced to 68¾c, dropped to 67¾c, reacted to 68¼c, weakened and closed with sales at 68c and 67¾c bid. Sill & Odell venture, on Johnson tract,

Kinzua Village, showing for 200 barrels a day. Reibold—Phillips, Markle, No. 9, 52 barrels an hour. Field production 5830 barrels from 57 wells. Two sons of C. Redick fatally burned at Renfrew City, Butler county, while lighting a fire of natural gas at the school house.

April 30.—Market opened at 68½c, advanced to 68¾c, the highest point of the day. It steadily declined and closed at the lowest point, 66½c. Washington gauge 8433 barrels from 180 wells. Campbell, No. 2, on Wade, doing 1032 barrels a day; McKeown's, Martin, No. 4, 400. The four wells at Taylorstown 567 barrels. Supposed case of infanticide discovered at Titusville. No clue to the guilty parties.

Notes on Natural Gas.

Clifton, Missouri, has organized a gas company.

A company has been formed at Hartselle, Alabama, to bore for gas.

The Marine City Salt and Brick Works will drill a well at St. Clair, Michigan.

Dr. W. W. Easton is making arrangements to sink a test well near Dowagiac, Michigan.

Carlinville, Macoupin county, Illinois, also claims to have found evidences of natural gas.

The Birmingham Natural Gas and Fuel Company is drilling for gas near Birmingham, Alabama.

The Paris Natural Gas, Coal and Oil Company has been organized to drill test wells at Paris, Edgar county, Illinois.

The Getzville Natural Gas Company, of Getzville, Erie county, N. Y., has been incorporated with a capital stock of \$100,000.

The Maysville Natural Gas Company, of Maysville, Kentucky, has advertised for proposals to drill a well 2000 feet in depth.

The Benton Harbor Natural Gas Company, of Benton Harbor, Michigan, has been incorporated by B. J. Morrison and others.

The Peoples' Natural Gas and Fuel Company, of Nashville, Tennessee, is making ready to develop supposed oil and gas lands in Tennessee.

The Flemingsburg Natural Gas Company, of Flemingsburg, Fleming county, Kentucky, with a capital stock of \$30,000, is drilling a test well.

A well 950 feet deep has been drilled at Fairmount, Grant county, Ind., and when eighteen feet in the Trenton rock a fair amount of gas was struck.

The T. P. Benjamin Oil and Gas Company, of Bardstown, Kentucky, controls 41,000 acres of land in Kentucky, on which it proposes to sink several wells.

The Belt Oil and Gas Company, of Mt. Vernon, Ohio, with a capital stock of \$100,000, has been organized by William S. Harlan, J. B. Yates, L. E. Reynolds and others.

Massilon, Ohio, is drilling for natural gas. The Massilon Natural Gas and Oil Company was organized April 28, with a capital stock of \$20,000, divided into shares of \$10 each.

The Winfield Light, Heat and Power Company, of Winfield, Cowley county, Kansas, has been organized with a capital stock of \$10,000, and will drill for gas, coal or oil.

The Home Natural Gas Company, of Brownsville, Pa., has increased its capital stock from \$10,000 to \$100,000, and its great well is said to have a capacity of 8,000,000 cubic feet per day.

Since November 15, 1885, nearly 200 natural gas and oil companies have been incorporated in the State of Ohio, with an aggregate capitalization of about ten millions of dollars.

PETROLEUM IN KANSAS.

BY ROBERT HAY, U. S. G. S.

BESIDES the slow flow or drip of mineral oils from shallow wells or springs occurring in so many parts of Kansas, there are three bored wells which are now yielding oil. On these Prof. E. H. S. Bailey, of the State University, has made reports, which we are permitted to use here. The first report was made in December, 1885, and related to the oil from the Wyandotte well. Prof. Bailey says:

"The sample was submitted to fractional distillation, following as nearly as possible the processes used for the refining of crude petroleum. The oil itself is thick, dark brown, and has a peculiar and characteristic asphaltum odor. It has a specific gravity of .928, does not take fire when touched by a lighted match, but will burn when heated to 298° F.; then it burns with a very smoky flame, depositing carbon.

"The temperature at which the distillation took place, the quantity of distillate, the specific gravity of the distillate, its flash point by the closed tester, and its ignition point, are noted in the following table:

	1.	2.	3.	4.	5.	6.	7.	Oil.
Temperature below..	347° F	392°	437°	482°	527°	572°	Ab'e.	
Quantity, parts per 1000	32	38	45	105	25	120	632	1,000
Specific gravity.....	.770	.794	.811	.820	.840	.851	.868	.928
Flash point.....	100° F	111°	116	170	204	218	306	172
Ignition point.....	120° F	150	160	210	258	266	350	298

"It was noticed that a comparatively large quantity of distillate came over at about 475° and also at about 560°. As will be seen, five-eighths of this oil has a very high boiling point, coming over above 572°. In the case of petroleum distillation, these oils are called paraffin oils, and from them is separated the solid paraffin by cold and pressure. Some of this high-boiling-point material became nearly solid when placed in a freezing mixture. It will be noticed, also, that there is very little of this oil that has a 'fire test' or flash point below 170°. As all the distillates above mentioned burn readily from a wick, there is little doubt that they would make an illuminating material equal to the better grades of kerosene oil. The oils having an ignition point too high for this might be utilized for lubricating machinery.

"On account of the abundance of crude petroleum, and its cheapness, and the comparative scarceness of this mineral oil, it is not probable that the practical manufacturer will at present see any advantage in using the latter over the former. As regards quality, however, there seems to be nothing in the way of the utilization of this material."

At the meeting of the Academy of Science, in November, 1886, Prof. Bailey reported on an examination of the Fort Scott mineral oil. On this he says:

"The crude oil is similar in appearance to that from Wyandotte. It has a specific gravity of .9224, and a flash point of 385° Fahr. A specimen was distilled, using a temperature as high as 600° Fahr., more than one-half of the oil distilled over at this temperature yielding an almost colorless product. This product burns readily, by the use of a wick, and is an excellent lubricating oil. The crude oil also has been shown, by actual experiment, to possess lubricating properties superior to any in this vicinity."*

* Prof. J. J. Stevenson, of the University of New York city, is making collection of the mineral oils of the United States. He has the collection on exhibition in the Museum of the University. Of a sample of the Fort Scott oil he says, in a letter received while this is going through the press: "The oil differs strangely from our carboniferous oils in Pennsylvania, Ohio and West Virginia. It must be a very fair lubricator."

The writer procured a sample of oil with water from a well forty-five feet deep on the farm of Mr. Pease, three miles east by south from Hepler, in Crawford county. It is obtained from a fine-grained sandstone, which is dark with oil on being first taken out, but after evaporation it becomes lavender-colored. It is evidently of the great sandstone horizon whose outcrop yields the fine flagstones of Crawford and Bourbon counties. Submitting the sample to Prof. Bailey, he reports as follows:

"The oil is quite fluid, and burns readily on being heated to a high temperature. It appears to be very much like the Fort Scott sample in odor and consistency.

"The water from the same well was quite turbid. It contained silica, lime, magnesia, with some phosphoric, sulphuric and hydrochloric acids.

"The sediment consisted largely of some organic or carbonaceous matter, with considerable iron and lime. It is probably a product resulting from the partial decomposition of hydro-carbons in the shale from which it flows."

The last well does not yield any large quantity; but as several miles eastward the flagstones of the same horizon are frequently odorous of oil at their outcrop, it is not improbable that if the formation is continuous further west, where it would be buried under a greater thickness of other strata, it may yield both gas and oil to the drill in Neosho county.

As prospecting is now being more actively carried on, and more care is taken with the drilling of the bore holes, it is not improbable that, as the yield of oil diminishes in Pennsylvania (as it is steadily doing), Kansas may produce oil that will yield a fair remuneration to the intelligent investor.

THE Indiana Natural Gas Company, a Standard Oil Company organization, has leased 12,000 acres of land between Anderson and Noblesville, Indiana. A strong gasser has been opened up on the Wainwright farm, near Noblesville. Ten more wells will be sunk at once and the gas piped to Indianapolis, which is only twenty-two miles distant. The company is capitalized at \$1,000,000 and proposes to supply Indianapolis and other adjacent cities with gas in four months' time.

THE Fredonia, (N. Y.) gas well, at the foot of Eagle street, in that village, will be sunk to the Trenton rock, which it is expected will be reached at 2500 feet. Thirty feet of rock was found at 2156 feet, which resembles very closely the Clarendon oil sand and which contained gas in considerable quantities. The salt water, which was cased off by a string of casing 1964 feet in length, was black as ink and very strong.

THE Baden Gas Company has completed its new line from Sewickley to Allegheny City and located seven new wells. The main line will be extended from the Allegheny City limits to the Pittsburgh Locomotive Works, on Beaver avenue, where connections will be made with the lines of the Rochester Natural Gas and Pipeage Company.

Two independent pipe lines compete with the Tidioute and Titusville branch of the National Transit Company for the production of the Grand Valley field, and the oil now commands a premium of 17½ cents a barrel above regular market values.

JOSEPH McDONNELL and others are building a new refinery at Titusville.

APRIL OPERATIONS.

THE ENTIRE REGION—WELLS COMPLETED, WELLS DRILLING, AND RIGS UP AND BUILDING.

WELLS COMPLETED IN APRIL, 1887.

Allegany Field.

Twp.	Owner.	Barrels.
Alma, 26,	Wyvell & Miles.	3
Wirt, 62,	(Peterson) Burton, H & O'Neill	8
" 47,	(Johnson) McQueen & Thurston No 1.	6

Wells completed.....	3
Production	17
Dry	0

Bradford Field.

East and West Branches.

Warrant 2263, Van Vleck & Mitchell	No 42.....	5
" 2263, R J Straight	No 22.....	5
Mack, Manufacturers' Gas Co	No 4.....	dry

Knapp's Creek.

Borden, J S Rogers.....	8
Keating, Forest Oil Co No 54.....	5
Ellis, Dr Chrisman.....	3

Foster Brook.

C B & H, Watson Oil Co	No 49.....	8
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Indian Creek.

Weston, Williams & Franchot	No 13.....	8
Gale, G N Moore	No 11.....	8
H Loop, Franchot Bros	No 42.....	5

Four-Mile.

Stevens, Stevens Bros.....	5
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Cole Creek.

Bingham, lot 588, Associated Producers	No 65.....	12
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Kinza.

Woods' lease, Stewart & Co No 3.....	10
Bonanza, Newell & Quigley No 2.....	10
Lot 128, P T & W C Kennedy No 6.....	6
Warrant 2241, Keating Oil Co.....	dry

Wells completed.....	16
Production	98
Dry	2

Warren and Forest.

GLADE AND OTHER TOWNS.

Kinza Village.

Morrison, Anchor Oil Co No 13.....	10
Weed, Morse, Collins & Heasley No 8.....	25
“ “ “ “ No 9.....	dry
Mundy, Collins & McCalmont Oil Co No 1.....	5
Willie Run, Smith, Bright & Co No 8.....	3
5554, “ “ “ “	dry
Sugar Run, Phillips & Hubbard.....	dry
5564, (Johnson) Odell, Smith & Co No 1.....	50

Wells completed.....	8
Production	93
Dry	3

Clarendon.

35, Henderson & Murphy.....	5
35, Bell & Hazeltine.....	5
76, Curtis & Hue No 2.....	5
463, Fred Hue No 3.....	3
463, Wm Spence.....	5
463, Ed O'Donnell No 2.....	5
464, Columbia Oil Co No 24.....	6
105, Sam Tait Jr No 5.....	2
107, Mitchell & Boggs.....	5
562, Goal Bros No 3.....	3

Wells completed.....	10
Production	44
Dry	0

Tiona.

200, (Hague) Wesley Chambers	No 5.....	5
201, " " " "	No 11.....	6
201, Keegan, Sage & Co.....		5
244, Horton, Crary & Co	No 23.....	6
244, " " " "	No 24.....	6

Wells completed.....	5
Production	28
Dry	0

Cooper District.

Henry's Mills, J L McKinney & Co.....	10
Wells completed.....	1
Production	16
Dry	0

Balltown.

741, Horton, Crary & Kraeer No 3	dry
5214, James C Welsh	8

Wells completed.....	2
Production	8
Dry	1

Kane.

343, (Looker) Ernhart & Co	No 2.....	5
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Wells completed.....	1
Production	5
Dry	0

Grand Valley.

Lot 327, (Upton) McConnell & Co	No 3.....	dry
" 330, (Rheinhardt) Boiles & Roberts.....		dry
Phil Lands, Crippens & Phillips	No 5.....	dry
Campbell, National Oil Co	No 13.....	15
" " " "	No 14.....	12
" " " "	No 16.....	10
" " " "	No 17.....	12
Hunter, " " " "	No 21.....	10
" " " "	No 22.....	12
" " " "	No 23.....	10
Rouse, " " " "		dry
Tew pur, C W Scofield.....		6
Lot 150, Nelson Farrell	No 12.....	10
" 151, Cadwallader & Co	No 2.....	5
R T Gilson, Stewart & Co.....		3
Gibbs, L B Wood & Co	No 3.....	10
" " " "	No 4.....	10

Wells completed.....	17
Production	125
Dry	4

Miscellaneous—Elk County.

2565, C G Thyng.....	dry
2019, Clark & Foster.....	5
2033, " " " " No 2.....	15
3664, (North half) Clark & Foster No 2.....	10
3664, (South half) " " " " No 2.....	12
2033, Porter, Thyng & Co No 3.....	12
Forest, 3672, Duhring Oil Co.....	5
Wilcox, 2426, Markham & Co.....	dry

Wells completed.....	8
Production	59
Dry	2

Lower Country.

Venango and Other Sections.

Farm.	Operator.	Barrels.
Moon, Oil City Fuel Supply Co.....	gas	
Mt Hope, Dr Galbraith No 3.....		15
Milton, Shafer & Milton.....		5
Moffett, (French creek twp) Parker & Co.dr		
Buchanan, J M McCandless.....		10
Columbia, Columbia Oil Co No 172.....		15
Victory twp, Conway Bros.....	dry	
Wallaceville, Phillips Bros.....	dry	
Pioneer, (Keech) J Stillwagon.....	dry	
Griffin, James Purtell No 3.....		2
Leech, (Pithole) John Lee.....	dry	

Vicinity Pleasantville.

Rhodes & Beaver, W P Black.....	dry
Fleming, W P Black No 1.....	8
Sam Fleming, Slegins & Son.....	4
Aekison, (Shamburg) Wait Bros.....	20
Intleff, Thurman & Co.....	dry

Tipperary, Hall's Run, Etc.

J Fox, Beers & Co	No 2	5
Siggins, Taylor, Torrey & Murphy	No 10	8
Burns, George Duncan		dry
Church lot, Deitrich & Warfield	No 1	8
Willis,	"	dry
W d Shafer,	"	dry
Coal lands, J B Smithman		dry
Bredin, Geo Jack & Co		gas
Craig, Wooster, Stubler & Co		dry

Tarkill.

Alex Hill, Fisher & Judd.....	10
Thompson, Hess & Sackett No 2.....	25
Lloyd lands, Reno Oil Co No 3.....	6

Nickleville.

Heuston, Myers Bros.....	dry
Watson, Watson Bros.....	dry

Rockland or Red Valley.

Wicks, W H H Piper	No 13.....	10
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Vicinity Emlenton.

King, Wm King.....	2
Dr Crawford, Wm Weaver No 8.....	3
Johnson, Shell & Knight.....	2
Kohlmeyer, Daniel Wilbur & Co.....	3
Russell, Thomas Griffin.....	2

Bullion.

Hovis, Hovis & Co.....	dry
Wells completed.....	37
Production	163
Dry	17

Clarion.

Buzza, Brothers & Hamm No 4.....	15
Heater, Hulings Bros.....	10
Stumpner, Stumpner Oil Co.....	20
David Whitehill, P F Krihbs & Co.....	dry
Deloe, P F Kribbs & Co.....	dry
Black, Berlin & Son.....	10
Cotterman, Black Bros.....	dry
Hahn, Hahn & Wagner.....	5

Wells completed.....	8
Production	60
Dry	3

Butler and Armstrong.

Jas Coyle, M P Black & Co	No 1.....	10
" " " "	No 2.....	25
D Markle, T W Phillips & D Osborne	No 8.....	65
" " " "	No 9.....	1250
" " " "	No 10.....	180
" " " "	No 11.....	600
Gelbech, " " " "	No 2.....	231

Gelbech,	"	No 11.....	600
Heid, Leidecker Bros	No 8.....	No 2.....	231
Blakeley,	No 3.....		10
"	No 4.....		125
"	No 5.....		120
			100

J Miller, P Smick & Lenz.....	10
Behm, Burchfield & Co.....	450
Blakely, Coast & Son est.....	10
Hickey, Branch Creek Oil Co.....	10
Peter Fennel, Greenlee & Temple No 1.....	12
“ “ “ No 2.....	7

Martinsburg.

Knox, Brown & Stanton.....	15
" Jordan & Co.....	25

Thorn Creek.

Klingler, Thayer & Crosby	No 2.....	15
Winner, " " " "	No 1.....	15

Wells completed.....	25
Production	3310
Dry	2

Washington.

Barre, Forest Oil Co	No 7.....	25
“ “ “ “	No 12.....	50
Morgan, Union Oil Co	No 7.....	10
“ “ “ “	No 9.....	125
Taylor, “ “ “ “	No 6.....	15
Wade, B B Campbell	No 2.....	1032
“ “ “ “	No 3.....	117
W J Munce, John McKown	No 13.....	70
Martin, “ “ “ “	No 1.....	15
Martin heirs, “ “ “ “	No 4.....	400
Smith, Willets, Young & Chartiers Oil	Co No 4.....	94
Munce heirs, Willets & Son	No 18.....	100
“ “ “ “	No 25.....	20
Montgomery, Montgomery	No 1 est.....	15
Martin, Central Oil Co	No 2.....	50
McNary, Chartiers Oil Co & Hallam	.....	10
McKenna, C O & Gas Co	.....	dry
Leech, W Va Nat Gas Co	.....	gas

Wells completed.....	18
Production	2148
Dry	2

Shannopin.

A P Morrow, Raccoon Oil Co & Solar Oil	Co No 2.....	50
Stevenson, " " " "	No 5.....	gas
Davis & Buff, Union Oil Co est.....	10	
Good, J M Guffey & Co.....	gas	
Hartman, " " " "	dry	
John McConnell, P M Shannon.....	10	
McCartney, Tomlinson & Co.....	dry	
Bethany, Hazelwood Oil Co.....	dry	
Wade P O, Ohio, Craig & Cappeau.....	dry	
McElheny, Frederick & Calhoun.....	dry	

Wells completed.....	10
Production	70
Dry	7

DRILLING WELLS.

RIGS UP AND BUILDING APRIL 30, 1887.

Allegany Field.

Scio.

Lot.	Owner.	Depth.
3,	Coyle & Simon (old).....	rig

12, Allen & Morse (old).....	rig
12, Griffin & Co No 10 (old).....	rig
50, Pease & Coyle No 9 (old).....	rig
46, L G Norton No 2.....	drilling

New rigs.....	0
Old rigs.....	4
Drilling.....	1

Total..... 5

Alma.

3, M J McMullan & Co No 5 (old).....	rig
23, Vance & Horton (old).....	rig
26, Willets & Elliott (old).....	rig
51, Sawyer & Co (old).....	rig
120, McCalmont Oil Co No 10 (old).....	rig

New rigs.....	0
Old rigs.....	5
Drilling.....	0

Total..... 5

Wirt.

47, (Voorhees) Applebee & Mix No 2 (old).....	rig
48, (Church) McNorton, Denning & Co No 2 (old).....	rig
52, (Jacob Jordan) Wilson & Johnston No 9 (old).....	rig
53, (Van Velsor) P M Shannon & Co No 1 (old).....	rig bldg
55, (Orson Witter) P M Shannon & Co No 1 (old).....	rig
61, (J Jordan) Ackerly, Barton & Co (old).....	rig
61, (Isaiah Jordan) Lester, Jordan & Co No 6 (old).....	rig
61, " " No 7 (old).....	rig
62, (Peterson) Limekiln Club No 4 (old).....	rig
62, (Latham) " " No 1 (old).....	rig
47, McQueen & Johnston No 2.....	drilling

New rigs.....	1
Old rigs.....	9
Drilling.....	1

Total..... 11

Bolivar.

12, Wood & Co (old).....	rig
23, F C Streeter & Co No 12 (old).....	rig
23, (Ketchum) Stewart & McDonald.....	drilling

New rigs.....	0
Old rigs.....	2
Drilling.....	1

Total..... 3

Genesee.

14, Merwin (old).....	rig
22, I Willets No 14 (old).....	rig
22, " " No 15 (old).....	rig
22, " " No 16 (old).....	rig
22, " " No 17 (old).....	rig
22, " " No 18 (old).....	rig
23, Coughlin (old).....	rig
29, William Cranston (old).....	rig

New rigs.....	0
Old rigs.....	8
Drilling.....	0

Total..... 8

Clarksville.

5, Lane, Lane Oil Co No 7 (old).....	rig
6, (Seever) Ackerly, Barton & Co No 9 (old).....	rig
6, (Hamilton) Ackerly, Barton & Co No 23 (old).....	rig
9, Houston & Brecht No 4 (old).....	rig
9, Merritt (old).....	rig
10, (Smith) Fritz & McKelvy.....	drilling
12, (Barton) Clarksville Gas Co (for gas).....	rig
5, (Weatherbee) Barton & Ackerly.....	rig

New rigs.....	2
Old rigs.....	5
Drilling.....	1

Total..... 8

Miscellaneous.

Shingle House, Mutual Gas Co (for gas).....	drilling
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New rigs.....	0
Old rigs.....	0
Drilling.....	1

Total..... 1

Bradford Field.*East and West Branches.*

Mack, Columbia Oil Co (old).....	rig
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Mack, Fisher Oil Co No 19 (old).....	rig
" Manufacturers Gas Co No 5.....	drilling
Clark, Clark & Owens.....	drilling
King, Wood & Young No 2 (shut down).....	100
Hatfield Wood & Young No 5.....	drilling
Paton, McClure & Co (old).....	rig
Hinchey, McMurray Bros No 6 (old).....	rig
Clark, McCray Bros (old).....	rig
Cutting, Booth & Bovaird No 2.....	drilling
Hooker, P Hooker & Son.....	rig

Quintuple.

25, O H Strong (old).....	rig
44, J W Humphrey (old).....	rig
260, E T Howes (old).....	rig

New rigs.....	1
Old rigs and shut down.....	9
Drilling.....	4

Total..... 14

Knapp's Creek.

Matthews, C B Whitehead No 6 (old).....	rig
Borden, T P Thompson (old).....	2 rigs
Duke, J West No 7 (old).....	rig
" " No 8 (old).....	rig
Erskine, Doe & Smith No 2.....	drilling

New rigs.....	0
Old rigs.....	5
Drilling.....	1

Total..... 6

Foster Brook.

E T Co, Kervin & Co No 10 (old).....	rig
C B & H, Juter & Yager (old).....	rig
" Clark, Cooper & Co No 9 (old).....	rig
" Burns & Monroe (old).....	rig
" Watson Oil Co No 50.....	rig
Melvin, P C L & P Co No 93.....	drilling
" " No 94.....	drilling
" " No 95.....	rig

New rigs.....	2
Old rigs.....	4
Drilling.....	2

Total..... 8

Four Mile.

Van Campen, Coldren & Vance (old).....	rig
" Jas K Van Campen No 3 (old).....	rig
Dye, Manhattan Oil Co No 5 (old).....	rig
Stevens, Stevens Bros.....	drilling

New rigs.....	0
Old rigs.....	3
Drilling.....	1

Total..... 4

Indian Creek.

H Loop, Franchot Bros.....	drilling
Haulin, M B Squiers No 4 (old).....	rig
Gale, G N Moore No 12.....	rig
" Barden, Cook & Doid No 1.....	1200
" " No 2.....	rig
W & M, McKinney Bros No 10.....	rig bldg

New rigs.....	3
Old rigs.....	1
Drilling.....	2

Total..... 6

Cole Creek.

Warrant 2263, Union Oil Co No 6 (old).....	rig
" 2263, " No 7 (old).....	rig
Bingham, lot 269, Bennett & Thompson No 11 (old).....	rig
" lot 477, Tucker & Rolfe No 3 (old).....	rig
" lot 588, Ass'd Producers No 66.....	800
" lot —, C P Byron No 14 (old).....	rig
Farmers' Valley, Smith & Boyer.....	drilling

New rigs.....	0
Old rigs.....	5
Drilling.....	2

Total..... 7

Kinzua.

Guffy & Hulings, Union Oil Co No 71.....	1500
" " No 72.....	rig
Wood's lease, Stewart & Co No 4.....	drilling
" " No 5.....	rig
Lot 128, P T & W C Kennedy No 5.....	drilling
Lot 6, Rittersville, Jno J Carter No 20.....	drilling

New rigs.....	2
Old rigs and shut down.....	0
Drilling.....	4

Total..... 6

Warren and Forest.**GLADE AND OTHER TOWNS.***Kinzua Village.*

Weed, Morse & Collins No 10.....	sand
" " No 11.....	rig
Hodge, " No 2.....	drilling
" " No 3.....	rig
White, Collins & McCalmont Oil Co No 9.....	sand
" " No 10.....	rig bldg
Willie Run, Smith, Bright & Co No 9.....	300
5554, Columbia Oil Co.....	100
Johnson, Sill & Odell No 2.....	rig
Dew Drop, Fogel & Co.....	drilling

Warren.

Rankin, McWilliams.....	rig
Clark, Cogswell & Co No 4.....	rig
" Jas A Clark.....	rig
Irvine, Brown Bros No 9.....	drilling

New rigs.....	7
Old rigs.....	0
Drilling.....	7

Total..... 14

Clarendon.

35, Hazeltine & Bell.....	drilling
35, Henderson & Murphy.....	drilling
463, Fred Hue No 7.....	rig bldg
497, D Riddlesperger.....	drilling
497, " ".....	rig
463, Ed O'Donnell No 3.....	drilling
105, Tucker & Co (old).....	rig
105, Hackett & Shirley No 7.....	drilling
104, O'Donnell & Hill No 4.....	drilling
107, W B Roberts & Son No 20 (old).....	rig
107, Mitchell & Boggs.....	drilling
521, S Short & S in No 18.....	drilling
532, C A & D Cornen.....	rig
555, Doc Jenkins No 2 (old).....	rig
556, J A Waterhouse & Co No 25 old.....	rig
556, " " No 26 old.....	rig
556, " " No 27 old.....	rig
562, Goal Bros No 4.....	drilling

New rigs.....	3
Old rigs.....	6
Drilling.....	9

Total..... 18

Tiona.

240, (Tidewater) John J Carter.....	drilling
244, Horton, Cray & Co No 25.....	drilling
281, " ".....	rig
284, Watson & Mitchell No 8 (old).....	rig

New rigs.....	1
Old rigs.....	1
Drilling.....	2

Total..... 4

Cooper District.

407, Shank & Stewart No 9 (old).....	rig
407, " " No 13 (old).....	rig

New rigs.....	0
Old rigs.....	2
Drilling.....	0

Total..... 2

Balltown.

3194, Poreupine Oil Co No 39 (old).....	rig
3195, (Crisman) N F Clark No 14 (old).....	rig
5214, J C Welsh.....	rig
Proper Reserve, Proper Reserve Oil Co.....	drilling

New rigs.....	1
Old rigs.....	2
Drilling.....	1

Total..... 4

Kane.

343, (Looker) Ernhart & Co No 3 (old).....	rig
343, Basswood Oil Co No 1.....	drilling
344, Treat & Mallory No 8 (old).....	rig
420, Coast & Sons No 24 (old).....	rig
3767, Craig & Cappeau No 40 (old).....	rig

New rigs.....	0
Old rigs and shut down.....	4
Drilling.....	1

Total..... 5

Grand Valley.

Blakeslee, Miller & Crippens No 10.....	100
Phil lands, Crippens & Phillips No 6.....	rig
Torpedo, McConnell & Co No 4.....	rig
Ellis, Reno Oil Co.....	rig bldg
Campbell, National Oil Co No 15.....	drilling
" " No 18.....	rig
" " No 19.....	rig
Hunter, " No 14.....	drilling
" " ".....	rig

Gibbs, L B Wood & Co No 5.....	rig
" " " No 6.....	rig bldg
Knapp, " " No 2.....	drilling
" " " No 3.....	rig
Wales, (151) " " No 7.....	drilling
Brenn, John Brenn No 5.....	drilling
Anderson, Brown Bros.....	drilling
Proper, Boyce & Duck No 1.....	drilling
Lot 150, Nelson Farrell No 13.....	rig
" 135, Emery & Ralston (shut down)	sand
" 137, G P Kepler & Co (old).....	rig
" 238, J B Jennings & Grandin	(old).....
Spring Creek, (Shaw) Stewart & Co	rig
Enterprise, (lot 54) S P Robinson	No 2.....
" (Sutliff) Coldron & Co.....	sand
" Dibble, Dibble Bros.....	rig
New rigs.....	12
Old rigs and shut down.....	3
Drilling.....	10
Total.....	25

Miscellaneous—Elk County, Etc.

2033, Clark & Foster No 3.....	500
2033, " " No 4.....	rig
3663, " " ".....	sand
2033, Porter, Thyng & Co No 4.....	1600
2033, " " No 6.....	1300
2032, Boggs, Rosenberg & Co No 4.....	1200
2033, Highland Oil Co.....	sand
3663, Boyer, Simpson & Co No 3.....	1800
2027, Taylor, Torrey & Co No 1.....	sand
1799, L E Mallory & Co.....	rig
4022, Coast & Sons (old).....	rig
Climax, (Jefferson Co) Ellis & Co.....	2200

Warren and Forest Counties.

Sutton Hill, A F Fritts (old).....	rig
Youngsville, (John Siggins) Scranton Oil Co (old).....	rig
McIntyre, John J Carter No 3.....	drilling
Proper, (Tionesta) Groves & Co.....	rig
New rigs.....	3
Old rigs.....	3
Drilling.....	10
Total.....	16

*Lower Country.**Venango and Other Sections.*

Allegheny Bank lands, Oil City Fuel Supply Co.....	rig
McBride, Thomas Smith (old).....	rig
Kaufman, A P Dale No 9 (old).....	rig
" " " No 10 (old).....	rig
Osmer, Galbraith & Parker (old).....	rig
Mt Hope, Dr Galbraith No 4.....	rig
Slab Furnace, S P McCalmont (old)	rig
Main, W J Robinson (old).....	rig
Rynd, Wratten & Co (old).....	rig
Columbia, Columbia Oil Co.....	rig bldg
Tract 47, J J Fisher No 10.....	rig
Eagle Rock, Daggett & Co (shut down).....	400
Pithole, (Blank) Duke & Applebee (old).....	rig
Griffin, James Purtell No 4.....	rig
Sunville, (Grove) Phillips Bros.....	drilling
Pioneer, (Keech) J Stillwagon.....	rig
" (McElheney) Pres McCray.....	rig
Pearson, Mojar Bros.....	drilling
Bully Hill, (Miller) Smith & Galbraith No 3.....	drilling
Cherry Tree, Wilson Bros.....	rig

Vicinity Pleasantville.

Landas, W P Black No 6.....	rig
Tallman, (Shamburg) W P Black.....	rig
McCune, " " ".....	rig
Folwell, " " ".....	drilling
Fisher, (Shamburg) Young & Loucks	No 3.....
Sheppard, J Sheppard (old).....	rig

Tipperary, Hall's Run, Etc.

Moore, Bee's & Co No 3 (shut down)	750
M Fox, Davis & Co.....	rig bldg
Siggins, Taylor, Torrey & Murphy	No 11.....
Moore, Speechley & Co No 2 (old).....	rig
Big Meadow, Huff, Reidy & Osborne.....	drilling
McCalmont, S P McCalmont.....	drilling
Saddler, Wolf & Kugler No 2.....	sand
Sheppey, Judd & Geiser.....	sand
Church lot, Deitrich & Warfield No 2	drilling
" " " No 3.....	rig
Toberer, Gailcy, Roe & McBride.....	drilling
Diamond, E Lynch & Co.....	drilling
Kennedy, McKeever.....	drilling

Tarkill.

J S McCalmont, Canning & Goettel	No 9.....
Thompson, Clark & Foster.....	rig
Webb, Taylor, Torrey & Murphy	No 10.....
" " " ".....	drilling

Rockland or Red Valley.

Wicks, W H H Piper No 14.....	rig
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Vicinity Emlenton.

D Russell, Baum & Co (old).....	rig
W P Grant, J V Ritts (old).....	rig
" " " Edwards & Co.....	sand
Hays, James Bennett.....	rig
Byrom Centre, (Robinson) Middle-	ton & Co.....
" (Phil lands) Sam Phillips.....	sand

Bullion.

Crawford, Hoffman & Co.....	600
Dougherty, Hovis & Co.....	100
McFadden, Forest Oil Co.....	drilling

New rigs.....	18
Old rigs and shut down.....	14
Drilling.....	20

Total estimated.....52

Clarion.

Bressel, Berlin & Sons No 3.....	drilling
Widiken, " " No 1.....	drilling
Hess, Hess & Sackett.....	drilling
McDowell, Amsler Bros.....	rig
Smith, Smith & Wagner No 2.....	drilling
Berlin, Berlin & Sons No 15 (old).....	rig
John Henel, Koch Oil Co No 8 (old)	rig
Lloyd, Dr Metzger (old).....	rig
Shredler, McCallom & Co (old).....	rig
Wagner & Carl, J V Ritts (old).....	rig
Heasley, Heasley & Co (old).....	rig
Brown, J V Ritts (old).....	rig
Stover, Stover & Co.....	drilling
John, Johnson & Buzzard.....	drilling

Reidsburg.

McElravy, M L Lockwood & Co.....	sand
Shiry, Arnold, Stewart & Co.....	drilling
" " " Hess, Sackett & Co.....	rig bldg

New rigs.....	2
Old rigs.....	7
Wells drilling.....	9

Total.....18

Butler and Armstrong.

F Miller, W G Crawford & Co (old).....	rig
Chas Duffey, Hoch & Co (old).....	rig
J Kline, Westerman & Co.....	800
Hough'on, Forquer Bros No 2 (old).....	rig
Washington twp, Fletcher farm, Armstrong, Campbell & Co (old)	rig
Gumper, Ward & Stoup (old).....	rig
Steffin, T W Phillips & D Osborne.....	1400
Gelbech, " " No 3.....	1300
" " " No 4.....	rig
May, T W Phillips & D Osborne.....	1350
Morbarger, " " No 1.....	700
Dunbar, " " No 1.....	600
" " " No 2.....	300

Stewart, Phillips No 1.....	300
" " " No 2.....	100
" " " No 3.....	rig
" " " No 4.....	rig bldg
Behm, " " No 1.....	rig
" " " No 2.....	rig
" " " No 3.....	rig bldg
Blakeley, Leidecker Bros No 6.....	rig
" " " Johnson & Root No 2.....	rig
Peiffer, Reep, Westerman & Co.....	rig
" " " McTamany & Co.....	rig
" " " Marshall Oil Co.....	200
John Staples, M P Black & Co.....	1450
Behm, Winkle Oil Co No 2.....	600
Ash, Gibson, Gahagen & Lenz.....	800
Rev Hickey, Brushwood Oil Co No 5	rig bldg
Chas Duffey, McBride & Campbell	No 5.....
McElroy, Meldrum Bros & Co.....	800
McCandless, Reiber & Campbell	(gas).....
G Reiber, G Reiber & Co (gas).....	600
Chas Duffey, M Finegan No 6.....	rig bldg
axton Station, Brown, Hovis & Co	rig bldg
McClymons, Standard Plate Glass	Co (gas).....
Butler, Shenango Gas Co.....	rig bldg

Martinsburg.

Knox, Brown & Stanton.....	rig bldg
" " " Hoffman & Co.....	500
Knox, Jordan & Co.....	rig bldg
G Shakeley, M P Black.....	rig bldg
Fletcher heirs, S W McKee.....	800

Thorn Creek.

Maharg, Bolard & Thompson.....	1400
Dixon, Christie & Co.....	1500
Cooper, Thayer & Crosby & Anchor	Oil Co No 1.....
Burton, Russell & Greenlee.....	1400
" " " ".....	rig bldg
" " " Collins & Reeder.....	drilling
Klingler, Iman, Waldron & Co No 3.....	1450
Barfon, Farmers' Oil Co.....	100
" " " Shoffer Bros & Co No 2.....	drilling

Bulford, Klingensmith.....	rig bldg
McClintock, S W Harley & Co.....	1200
Gibsonia, Preston & Huff.....	1530
Valencia, Munhall & Co.....	rig

New rigs.....	20
Old rigs.....	5
Drilling.....	27
Total.....	52

Washington.

I Wilson, Forest Oil Co (old).....	rig
Johnson, " " (old).....	rig
Barre, " " No 13 fishing	sand
W J Munce, John McKeown No 14	sand
" " " No 15	sand
" " " No 16	1900
Martin heirs, " " No 4.....	rig
Cameron, Willets, Young & Chartiers	Oil Co No 3 (fishing).....
" " " No 10.....	550
Munce Heirs, Willets & Son No 23	(old).....
" " " No 24 (old).....	rig
" " " No 26 (old).....	rig
" " " No 27 fish'g	sand
Cradle Factory lot, Miller & Co No 2	sand
Coal Center, Hornbake (shut down)	1100
Wiles, C O & G Co No 1.....	1800
" " " No 2.....	1150
Rooney, Reed & Co (old).....	rig
McKeesport, Stone & Co.....	drilling
Thome, Lee & Shank No 3.....	1000
Wright, Chartiers Oil Co & F W An-	drews (old).....
Martin, Assd Producers Co No 2 old	rig
Happer, A G Happer.....	1750
Whittle see, Caldwell & Co No 2.....	950
Workman, Union Oil Co No 3.....	400
Bane, Ten-Mile Oil Co (for gas).....	rig
Gordon, P L & H Co No 7.....	775
Welsh, Reed & Bryson.....	550
Fergus, Chartiers Oil Co No 3.....	150
Wade, B B Campbell & Co No 4.....	100

Taylorstown.

McMannis, Robbins & Guffey.....	2000
Woodburne, Forest Oil Co & Craig	1300
Ebenezer Davis, Wheeling Nat Gas	Co No 1.....
R Hamilton, Wheeling Natural Gas	Co No 1.....
Blayne, Hart Bros & Co No 2.....	1500
" " " No 3 (old).....	rig
McGraw Run, Wheeling Gas & O. I	Co.....
Carrothers, West Virginia Natural	Gas Co.....
Donahey, " " ".....	550
R Cundall, G W Reed, Aiken & Van-	dergrift.....
Flack, West Virginia Nat Gas Co.....	150
New rigs.....	1
Old rigs and shut down.....	9
Drilling.....	29
Total.....	39

Shannopin.

Thos Pinkerton, J S McKelvy (old)	rig
Charles Eichel, Raccoon Oil Co No 4	(old).....
A P Morrow, Raccoon Oil Co & Solar	Oil Co No 24.....
" " " No 25.....	100
Stone, J M Guffey & Co No 3.....	800
Riddle, Philadelphia Co (fishing).....	1000
McKee, (Oakdale) Forest Oil Co.....	sand
Reed, Reed, Davidson & Co (fishing)	sand
Elizabeth twp, Frederick & Cal-	houn.....
John Morrow, Raccoon Oil Co No 4	(old).....
East Elizabeth, East Elizabeth Oil	& Gas Co (for gas).....

Greene County, Etc.

Fordyce, E M Hukill & Co No 1 (shut down).....	1360
Garard, E M Hukill & Co No 1 (shut down).....	drilling
Garard, E M Hukill & Co No 2 (shut down).....	1060
" " " ".....	rig
Hathaway, E M Hukill & Co No 1	(shut down).....
Mt. Morris, E M Hukill & Co No 1	drilling
Longanecker, " " (old).....	rig
Ninevah, Johnston & Hamilton.....	1200
Board Tree, Wheeling Natural Gas	Co.....
McGinnis farm, Wheeling Natural	Gas Co (shut down).....
Sugar Grove, Wheeling Natural Gas	Co (shut down).....
Moundsville, J W Craig & Co.....	drilling
Bristoria, Forest Oil Co (fishing).....	1100

New rigs.....	0
Old rigs and shut down.....	3
Drilling.....	12

Total.....15

THE PETROLEUM AGE,

DEVOTED TO THE
INTERESTS OF THE PETROLEUM TRADE.

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THE NEW YORK COMPROMISE MEETING.

AT the compromise meeting held at the Fifth Avenue Hotel, in New York, on the 15th of March, 1887, the following oil men were in attendance: Col. John J. Carter, W. L. Ralston and J. L. McKinney, of Titusville; W. B. Benedict, of Enterprise; Walter Horton, of Sheffield; Captain H. H. Cummings, of Tidioute; O. W. Beatty and F. H. Rockwell, of Warren; J. B. Agnew, of Tionesta; T. P. Thompson and W. P. Small, of Bradford; Alfred Short, of North East; L. H. Smith, of New York; Joseph W. Craig, of Pittsburgh, and W. A. Norton, of Allegany. P. M. Shannon, of Bradford, who was in New York on private business, attended the meeting. The Union Oil Company was represented by Hon. John G. Hall, of Ridgway. The Standard Oil Company was represented by six members of the executive committee, John D. Rockefeller, William Rockefeller, John D. Archbald, Benjamin Brewster, Charles W. Pratt and H. H. Rogers. Messrs. W. T. Scheide and Joseph Seep were also in attendance. John P. Zane was in New York but was not present at the conference.

The oil men who attended the meeting claim the right to act for and to represent themselves at any time and anywhere they see fit to do so. The producers who were not there and who declined to answer to Colonel Carter's call for a conference, entertain the opinion that the gentlemen in attendance lent themselves to a Standard scheme to divide the sentiment of the oil region on the Billingsley bill and to aid in its defeat. Col. Carter was elected Chairman of the meeting and Joseph W. Craig, Secretary.

As a result of this conference the following official notice was issued by the National Transit Company, and went into effect on May 1st:

NEW YORK, March 18.

Notice to the Patrons of the National Transit Company:

GENTLEMEN—As a result of a conference with a committee representing persons doing the larger part of the business with its lines the National Transit Company will at an early date to be fixed as below specified, promulgate the following rules by which it will thereafter be governed in its business, all rules not thereby altered to be observed as heretofore:

1. The deduction from oil received for water, sediment, shortages and waste will be two per centum instead of three per centum as heretofore.

2. The storage charge will be at the rate of twenty-five cents per day per thousand barrels of forty-two gallons each as long as the market price of certificate oil is below one dollar per barrel, thirty cents per day when the market price is from one dollar and fifty cents per barrel and forty cents per day when the market price is above

one dollar and fifty cents per barrel. No change, however, to be made in rate of storage on account of prices going above or below the prices named unless the market price remains above or below the specified point for thirty consecutive days.

3. The company will pay one cent per barrel for steam supplied by the producer in pumping oil from the producer's tanks into the lines of tanks of the company.

4. The company will, if required by the producer or owner of wells, connect to tanks of not less than fifty barrels capacity.

5. The company will deliver to the order of the producer the oil of each district at a delivery station within such district.

6. It having been arranged that a committee of producers consisting of three producers each from the Bradford, Middle and Lower Districts will be appointed to meet an equal number of the representatives of this company to investigate the questions relating to the steaming of oil and to make practical tests thereof in each of said districts, the plans adopted by said joint committee will be adopted by this company.

Due notice will be given of the date when the above rules will go into effect, which will be at as early a date as the necessary changes in gauges, certificates, well tickets and other necessary business arrangements can be made, which the company feel safe in assuring its patrons will not be later than May 15th next, and which it feels assured will be an earlier date.

THE NATIONAL TRANSIT COMPANY.

BENJ. BREWSTER, Vice-President.

In the *Era* of April 30th, under the editorial head of "Blessings Thick and Fast," the editor refers to the above six rules as the "unprecedentedly liberal concessions of the National Transit Company."

Mr. M. W. Quick, in an article published in the February AGE, demonstrates that the percentage charged for water, sediment, shortage and waste in handling oil was largely in excess of the actual losses experienced. The gauge made by the committee appointed by the Exchanges showed that the National Transit Company had a surplus of 667,896.71 barrels, or more than three per cent. of the entire stocks held. In the case at Duke Centre, where the royalty owner testified to the fact that oil had been stolen from the National Transit Company for a long time, the officials failed to convict the accused because they refused to produce their books and admitted that they would not show a loss of oil in the Bradford field. There is no concession in the cessation of taking what does not belong to them, though it can be done by compulsory rules and regulations.

Rule 2 in the above notice sets forth the rate to be charged for storing oil. The basis for making these statements is unbusiness like, and the rule reads like an extortion. The cost of iron tankage and the charge for maintaining the same should furnish the basis for fixing the storage rates, and not the price of the article stored.

The lines say in the above that they will extort twenty-five cents per day per thousand barrels of forty-two gallons each as long as the market price of certificate oil is below one dollar per barrel, and thirty, forty and fifty cents per day as the market gets higher.

Excessive storage rates have driven the long time investor and speculator out of the market. Besides the Standard people have held the market between such narrow limits in the last eighteen months that any fair profit which might come through an improvement in the situation would be used up in paying carrying charges. The treatment of producers who built iron

tankage in the Bradford field has been outrageous and will not bear an investigation.

In rule 3 the acme of magnanimity is reached in making an "unprecedented concession." The Tidewater Pipe Company have always paid the producer one cent per barrel for furnishing steam for pumping oil, and once on a time the United Lines gave value received for work done in this way. A number of producers here kept an account of the amount of oil pumped for the lines, and when the time comes more will be heard of the coerced free use of power in the movement of oil.

In the notice the outside refiner is not mentioned, and he was probably not considered at the New York meeting. Nothing was done to encourage honorable competition in refining oil. In short the men who believe that it is not a crime for a refiner outside of the Standard's gilded circle to build a fire under an oil still think the New York compromise meeting was too narrow gauged.

The Interstate Commerce Bill.

In his book on "The Railways and the Republic," Jas. F. Hudson devotes a chapter to the Standard Oil Company, which he aptly calls "The History of a Commercial Crime." In this article the methods by which the Standard people have acquired their millions are made plain to the reader. He says: This monopoly was called into existence and sustained in its most odious tyranny by the persistent and deliberate discriminations by the railways in its favor. Mr. A. J. Cassatt, of the Pennsylvania Railroad, testified before the New York Legislative Committee that in eighteen months the railways had paid to the Standard the sum of \$10,000,000 in rebates. Mr. Dan O'Day's letter to Mr. Cassatt, under date of February 15, 1878, disclosed the fact that the New York Central and Erie Railways were both paying rebates to the Standard Oil Company. This letter was brought to light by the State Investigating Committee and has been published in the oil region papers.

Through the rebate system the Standard Oil Company has been able to crush out all competition, and by this method they have scored a phenomenal success. The Interstate Commerce bill, which became a law on the 5th of April, if enforced, will do away with rebates and place all shippers on the same basis. Every producer and shipper in the oil country should get a copy of the act and read it.

The following sections of the act are produced below:
Special rates, rebates, drawbacks, etc., prohibited.

SECTION 2. That if any common carrier subject to the provisions of this act, shall directly or indirectly by any special rate, rebate, drawback or other device, charge, demand, collect or receive from any person or persons a greater or less compensation for any service rendered or to be rendered, in the transportation of passengers or property, subject to the provisions of this act than it charges, demands, collects or receives from any other person or persons, for doing for him or them alike and contemporaneous service in the transportation of a like kind of traffic under substantially similar circumstances and conditions, such common carrier shall be deemed guilty of unjust discrimination which is hereby prohibited and declared to be unlawful.

Undue or unreasonable preferences, advantages, prejudices and disadvantages prohibited.

SECTION 3. That it shall be unlawful for any common carrier, subject to the provisions of this act, to make or give any undue or unreasonable preference or advantage to any particular person, company, firm, corporation or locality, or any particular description of traffic, to any undue or unreasonable prejudice or disadvantage in any respect whatsoever.

THE PRODUCING REGION.

At the beginning of April there were 80 new rigs and 163 drilling wells in the New York and Pennsylvania oil region, a total of 243. The number of wells completed in April was 169, with an estimated new production of 6238 barrels. The dry holes numbered 43, leaving 126 productive wells with an average yield of 49 barrels. During March the entire region completed 89 productive wells and 44 dry holes, and the average of the new wells was 42½ barrels. The average of the February wells was 65½ barrels, of the January 30, of the December 30, of the November 31, of the October 30, of the September 62, and of the August 48 barrels. The April figures show an increase of 36 wells and of 2451 barrels new production, while March recorded a decrease of 14 wells and of 4274 barrels in the new production. At the close of April there were 79 new rigs, 119 old rigs and 158 drilling wells in the entire region, a total of 356, as compared with 80 new rigs, 122 old rigs and 163 drilling wells, a total of 365 at the close of March. This is a decrease of 1 new rig, 3 old rigs and 5 drilling wells from the figures of March 31. March showed an increase of 7 in active operations over February, while February had a decrease of 40 from the January report, January showed a decrease of 48 from December and December of 95 from the November figures. At the close of April, 1886, the record showed 247 new rigs, 140 old rigs and 356 drilling wells, a total of 743.

ALLEGANY FIELD.

But 3 wells were completed in the Allegany field in April, with a new production of 17 barrels, and at the close of the month only 5 drilling wells are under way. Six productive wells and two dry holes was the record for March. A wildcat well is being drilled near Shingle House, in Potter county, which is the only experimental test in the Allegany list.

THE BRADFORD FIELD.

The Bradford field shows an increase in new wells for the month last closed. Fourteen productive wells and 2 dusters is the sum of the April work, as compared with 7 producers and 2 dry holes in March. The Keating Oil Company's well, on warrant 2241, close to the Big Bridge, had a small showing of oil in the Bradford sand, enough the owners thought to warrant a profitable well. A heavy torpedo was powerless to increase the supply, and after drilling to a point below where the Smethport sand should have been found the well was abandoned. The Manufacturers' Gas Company is credited with another failure on the Mack lands in their search for a greater supply of gas. P. T. & W. C. Kennedy and Newell & Quigley have discovered a couple of fair wells in the extreme southwestern portion of the Bradford field, and extended the area of profitable territory in that quarter. At the close of April there were 8 new rigs and 16 drilling wells in the Bradford field, as compared with 8 new rigs and 12 drilling wells at the close of March.

WARREN AND FOREST.

There were 52 new wells completed in the Middle field in April, including 10 failures, and the new production was 372 barrels. This is an increase of 20 wells and of 91 barrels production, as compared with the figures for March. On the last day of April the field showed 27 new rigs, 21 old rigs and 40 drilling wells, against 18 new rigs, 22 old rigs and 39 drilling wells on the last day of March.

KINZUA VILLAGE.—The completion of Odell, Smith & Co.'s well, in the northeast corner of the J. R. Johnson

tract, warrant 5563, gives the development west of the river, at Kinzua Village, a good chance for an extension on a regular northeast and southwest course. This well when eight feet in the sand started flowing at a 200-barrel rate. Morse, Collins & Co.'s No. 9, on the Weed lands, warrant 5563, was a positive failure. Smith, Bright & Co.'s No. 8, was extremely small, while the same firm completed a dry hole on the southeast corner of warrant 5554. These results prove that the western border of the field has been found in the northeast quarter. The Columbia Oil Company has started an experiment on the western part of 5554, to the north of the Smith, Bright & Co.'s duster, on the same tract. The old Glade section, in the vicinity of Warren borough, which has been quiet all winter, is again showing a little activity.

Clarendon and Tiona reveal signs of increasing activity. Fifteen wells of the 5-barrel class were added to the list in April, and 15 rigs and drilling wells were under way on the last of the month. Fertig, McKinney & Co., the heaviest operators in the Tiona district, have made arrangements to pipe their own oil to the P. & E. R. R. at Tiona, and will ship the oil to independent refiners at Corry. They will keep the drill very busy this summer.

One well was completed in the Cooper district in April, at Henry's Mills, by J. L. McKinney & Co., which started at 40 barrels. Horton, Cray & Kraer's No. 3, on lot 741, northeast of Balltown, is almost a dry hole, and completes their operations in that quarter. James C. Welsh found another average well on the southwest. Nothing is doing in the Cooper district, and but one well is drilling in the Balltown field.

KANE.—A single well was drilling in the Kane field on the 30th of April, that by the McNulty Bros., or Basswood Oil Company, on lot 343. It is the farthest well yet located northward and found a strong vein of gas at 1900 feet. The Union Oil Company has purchased the Craig & Cappeau property, on warrant 3767, which consists of 36 oil wells, one gas well and a large area of undrilled territory. Ernhart & Co. completed a small well on lot 343 in April.

GRAND VALLEY.—Grand Valley, with two independent pipe lines, and a premium of 17½ cents per barrel on its oil, will give additional impetus to the drill the coming months. Seventeen wells were completed in April, including four dry holes, and the new production is estimated at 125 barrels; the month closed with 12 new rigs up and building and 10 drilling wells reaching for the sand. Crippens & Phillips finished a dry hole on the Philadelphia lands, in the eastern part of the field, while McConnell & Co. and Boiles & Roberts are credited with the same results on the north. L. B. Wood & Co. and the National Oil Company control the greatest amount of the undrilled territory. Cadwallader & Co. secured a 5-barrel well on lot 151, to the southwest, while Stewart & Co. were rewarded with a small producer in the Spring Creek section. A couple of wells are drilling near Enterprise and more or less prospecting is in progress throughout the country, where Warren, Crawford and Venango counties adjoin.

ELK COUNTY, ETC.—The Elk county oil field supplies a half dozen wells for April, ranging between 5 and 15 barrels a day. The wells are drilled very far apart and promise to hold their yield for a long time. With the completion of ten wells drilling on the first of May nearly all contracts for holding territory will be fulfilled and in forty days time most of the work in this section will come to an end. Taylor, Torrey & Murphy's venture, near the southeast corner of 2027, has been drilled

in the sand and completely mystified. L. E. Mallory & Co. are starting a test on the Gillis tract, warrant 1799. The test of C. G. Thyng, near the eastern part of 2565, is reported a failure. Markham & Wilcox finished a dry hole, near Wilcox, on warrant 2436, in their search after gas.

THE LOWER COUNTRY.

There were 98 wells completed in the Lower Country in April and 31 failed to find oil; the new production was 5751 barrels, an increase of 14 wells and 2337 barrels production over the March report. On the 30th of April the Lower Country had 41 new rigs, 38 old rigs and 97 drilling wells, as compared with 53 new rigs, 37 old rigs and 109 drilling wells on the 31st of March.

VENANGO.—The Venango district shows up 20 producing wells and 17 failures for the month of April. The new district at Hall's Run has supplied more dry holes than productive wells, and its future outlook is not at all promising. The test wells completed in various sections of the district were generally destitute of oil. The two wells at Nickleville were both practically failures. Phillips Bros. completed a dry hole near Wallaceville and have another drilling near Sunville. The Columbia Oil Company struck a good producer on Oil Creek and Wait Bros. found a fair well on the western edge of the old Shamburg development. Conway Bros. have drilled their well in Liberty township to a depth of 3500 feet without finding oil and will probably sink it 500 feet deeper. Venango records 18 new rigs and 20 drilling wells for the close of April, as compared with 22 new rigs and 24 wells drilling at the close of March.

CLARION.—As long ago as 1864 parties traveling from Pittsburgh to Oil City, when Oil Creek was the scene of a great oil excitement, were frequently heard to speak favorably of the oil prospects of Reidsburg. Unseen hands more than once have directed spiritualists, the foremost wildcatters of the oil country, to the section below Reidsburg where honest 'Squire Kifer, his good wife and comely daughters reside. The 'Squire often overheard the favorable comment which the conglomerate rocks in the meadow near his house provoked, and in the years which have elapsed since the thunders of a civil war were hushed, he never forgot the oil prospects of the locality over which he has watched the sun rise for more than a quarter of a century. About a year ago, at his earnest solicitation, M. E. Hess, Sackett & Co. came to Monroe township, leased about 4000 acres of land in a northeasterly and southwesterly direction from the Kifer farm, and drilled their first well on this farm. The pioneer well is located about two miles south of Reidsburg, along the road leading from that hamlet to Curlsville. The drill was started at this well on the 29th of January, and oil was struck on the 15th of February at a depth of 775 feet. The sand is said to be similar in texture and color to that found at Tiona and Clarendon. The operators and contractors who have drilled in the field had not decided whether it was the first sand or a stray sand which is found above the first sand. It is the same rock in which the gas is found at Mechanicsville, about four miles to the northeast. The sand which affords the oil was struck at 775 feet. It is reported to have had a thickness of fifteen feet, and the well was drilled to a depth of 805 feet. The well was tubed and they began pumping it on the 24th of February, and for the first fifty-six days the oil in the tanks gave it an average of seven barrels per day. While this pumping was being done some oil was hauled away by the farmers of the neighborhood. Hess, Sackett & Co. have drilled a second well on the Shiry farm, across the

groups on the different farms which make up the total of the Washington field for April 9 and May 7, 1887:

Farm.	Operator.	Number of wells, April 9.	Production April 9, Bbls.	Number of wells, May 7.	Production May 7, Bbls.
Gordon, P. L. & H. Co.		4	94	4	68
Hess,		3	20	3	13
Weirich, Forest Oil Co.		2	20	2	25
Hall,		4	30	4	50
Barre,		12	686	13	831
Taylor, Union Oil Co.		7	235	7	238
Morgan,		6	198	8	303
Davis,		7	650	6	850
Dye,		1	35	1	30
Workman,		2	300	2	300
McGovern,		1	25	1	25
Clark,		1	3	1	3
Gantz, Citizens' Oil & Gas Co.		1	23	1	12
Weaver,		1	9	1	7
Clark, Hallam & Co.		1	8	1	7
Taylor, Galligan & Young.		2	58	2	33
Zelt, Associated Producers Co.		1	3	1	2
Curry,		1	15	1	12
Wiley,		1	7	1	8
Martin,		1	13	1	13
Clark, R. H. Thayer & Co.		6	202	6	179
Munce, John McKeown.		10	450	13	440
Martin,		3	390	4	550
Quail,		1	10	1	10
Smith, Willets & Young & Chartiers O Co		5	104	6	163
Cameron,		9	430	9	452
Wright, Chartiers O Co & F W Andrews.		3	152	3	149
Fergus, Chartiers Oil Co.		2	254	2	306
Stewart, Fisher Oil Co.		1	56	1	44
Lead Lot, Marsh & Caldwell.		1	35	1	25
" McKeever & Mulholland.		1	15	1	12
Fair Grounds, Wheeling Oil Co.		3	84	3	64
Cradle Factory Lot, Miller.		1	35	2	53
Hall Lot, Guffey & Co.		1	5	1	5
Linn, Coast & Co.		3	79	3	79
Weirich,		1	10	1	13
Hayes,		1	10	1	7
Shirls, Shirls.		3	--	3	44
Manifold, Pew & Emerson.		2	62	2	62
Gabby,		1	5	1	5
Martin, Central Oil Co.		3	149	3	165
McGahey, Mascot Oil Co.		4	166	4	100
Miller, (Bunghole well), Reid & Co.		1	--	1	--
Montgomery, McKinney & Co. & Robbins.		2	19	2	19
Thome, Chartiers Oil Co & F W Andrews.		1	5	1	5
Wade, B. B. Campbell.		1	40	3	935
Weaver, Hart Bros.		1	15	1	15
Thome, Lec & Shank.		2	76	2	48
Wiley, Munhall & Co.		2	6	2	11
McKean, Caldwell & Co.		1	20	1	17
Van Kirk,		1	--	1	5
Whittlesee,		1	98	1	105
Watson, Butler & Co.		2	20	2	23
Martin, Allen & Co.		1	20	1	12
Munce, I Willets & Son.		24	757	24	704
Montgomery, Montgomery & Co.		--	--	1	15
McNary, Craig & C.		--	--	1	15
TAYLORSTOWN.					
McMannis, W Va Nat Gas Co.		1	55	1	60
Noble,		1	200	1	175
Blayne, Hart Bros & Co.		1	175	1	162
Cundall, Vandergrift, Reed & Aiken.		1	147	1	146
Total		168	6791	180	8228

Date.	No. of wells.	Production Barrels.
April 9, 1887	168	6791
May 7, 1887	180	8228
Difference	12	1437

SUMMARY of the Statement of the Tidewater Pipe Company, Limited, for April, 1887:	
Quantity of crude petroleum in custody at beginning of April	Barrels. 1,519,065.93
Quantity of crude petroleum at close of April	1,739,528.07
Less sediment and surplus	183,222.47
Receipts during April	1,556,305.60
Received in iron tanks	177,683.06
Deliveries during April—to refiners	193,167.99
" " to other parties	193,167.99
Outstanding certificates, accepted orders, etc.	783,000.00
Credit balances	773,305.60
Total liabilities April 30, 1887	1,556,305.60
MARCH SUMMARY.	
Quantity of crude petroleum in custody at beginning of March	Barrels. 1,501,613.00
Quantity of crude petroleum at close of March	1,686,319.30
Less sediment and surplus	167,253.37
Receipts during March	1,519,065.93
Received in iron tanks	180,639.79
Deliveries during March—to refiners	218,860.50
" " to other parties	218,860.50
Outstanding certificates, accepted orders, etc.	784,000.00
Credit balances	735,065.93
Total liabilities, March 31, 1887	1,519,065.93

The Macksburg Field in April.

The production of the Macksburg field, estimated from the pipe line runs, the shipments of the West Virginia Transportation Company, etc., averaged about 229 barrels a day for 1884. The gross runs of the Macksburg pipe line since January 1, 1885, with the estimated amount of oil shipped from the field through other channels is given below. The averages represent the best obtainable figures on the production of the field:

1885.	Macksburg P. L. Runs.	Outside Shipments. Est	Daily Average Production.
January	11,894	1500	432
February	20,625	1500	790
March	27,067	1500	922
April	40,527	1500	1400
May	48,258	1500	1605
June	64,982	1500	2216
July	75,737	1500	2492
August	74,228	1500	2443
September	68,110	1500	2320
October	63,619	7000	2278
November	60,926	7000	2264
December	61,113	7000	2197
Total	617,086	34,500	1785
1886.			
January	54,806	7000	1994
February	49,494	7000	2025
March	58,795	8973	2186
April	64,137	7890	2401
May	58,596	6600	2104
June	65,379	2871	2275
July	58,410	4080	2016
August	57,492	2790	1945
September	48,918	1240	1672
October	46,937	3240	1619
November	41,359	4090	1515
December	49,578	3040	1407
Total	645,101	58,844	1682
1887.			
January	37,134	4500	1343
February	28,514	1200	1061
March	32,549	7400	1015
April	29,128	4200	1110

But one new well was completed at Macksburg in April, and its capacity is not above five barrels a day. At the close of the month only two drilling wells are under way. No wells were completed in March. On the 30th of the month there were 466 producing wells in this field, with a total daily yield of 1110 barrels. One well was abandoned during the month, and at the present time thirteen are temporarily stopped from various causes.

The Kimbolton Oil and Gas Company struck a small gasser about seven miles from Cambridge, Ohio. Sixty-three feet of Macksburg sand was discovered and about twenty feet of the gas rock.

THE EUREKA DISTRICT.

At Eureka, W. Va., Johnson & Co. have started drilling about a half mile southeast of their gas well. B. F. Nye has a well under way on the Biddle farm, about two miles southeast of Brown, No. 1, (the so-called Burned well) and three miles from the river. The Cow run second sand was struck at 505 feet; it was twenty-five feet thick and contained some oil. The well was tested in this sand and pumped about 50 barrels, after which drilling was again resumed.

It is pretty generally believed about Eureka that Barnsdall & Co. have found oil at their well No. 1, near the "Burned well." Barnsdall has leased about 3000 acres in one block, in that vicinity, and invested considerable money. He has made a couple locations and will drill at once.

C. C. STOVER's pumping rig is giving complete satisfaction to those using it. In cheapness of construction and great saving of power it excells all others, and producers intending to couple up their wells should examine into its merits. See his advertisement in this number of the AGE.

SENATOR EMERY'S VINDICATION.

DURING the late interesting campaign, in which the Billingsley bill was under discussion, the Standard's servile press sought to defeat the bill by maligning every prominent man who advocated its passage. The merits or demerits of the measure were rarely discussed in the columns of papers whose policy toward pipe lines and pipe line interests is controlled and directed by the Standard Oil Company. Senator Emery was charged by the *Derrick* and *Herald* with having offered to sell his refinery in Philadelphia and his friendship for \$750,000. In the Senate on the 28th day of April he refuted these slanders in a most effectual manner. From No. 213 of the *Legislative Record* we quote the following:

Mr. Emery—I have been attacked by the press, my character has been defamed, and I wish to put myself on record as to the charges made against me. I ask that the communication which I send to the Clerk's desk be read.

The communication was read as follows:

\$750,000—*Senator Emery's Little Proposition—He Did Offer to Sell His Refinery and Friendship to the Standard.*

A few days ago the *Derrick* stated that rumors had become rife that Senator Lewis Emery, Jr., of McKean county, had tried to unload a cheap oil refinery at Philadelphia upon the Standard Oil Company at a figure seven times its real value, his "friendship" to be included in the property transferred. Not succeeding in roping in the ducats he at once began a warfare against the National Transit Company, using his position as a State Senator for that purpose. We stated that these rumors were afloat, and invited the Senator to aid us in arriving at the truth. After a day or two of urging, the Senator denied them in a general sort of way in an obscure newspaper printed at Meadville. The *Derrick*, however, went ahead with its investigations, and we are now ready to charge, and do charge, that Senator Emery did offer to sell his \$100,000 refinery and his "friendship" to the Standard Oil Company for \$750,000, adding that he thought he was "selling himself d—d cheap." It seems, however, that the Standard did not think the goods worth the money and declined to be bled. Now, we see this same Senator Emery chasing up and down the country, hurling his dreadful thunderbolts at the Standard, with David Kirk hanging to his coat tail. They still have refineries and friendships to sell, but we have not heard of any one who wants to buy. And these are the men who impudently announce themselves as "leaders" of the producers. Such an assumption is an insult to every honorable producer in the region.

Mr. Emery—Mr. President, I will hand to the Clerk another article and ask that the same be read.

The article referred to was read as follows:

"Editor of the *Tribune-Republican*:

"The tirades of the *Derrick* on me since February 14th up to and including to-day's issue, are false and without foundation. Misrepresentation and vilification seems to answer their purpose. The Standard Oil Company attempted their nefarious schemes on Logan, Emery and Weaver last September, and the public already have the knowledge of their seeming attempt at bribery. I think my standing out against the Standard Company and continually giving battle as a producer and legislator is quite sufficient evidence that I am now and always have been true to my constituency and myself, the *Derrick* notwithstanding.

LEWIS EMERY, JR.

"HARRISBURG, March 24, 1887."

Mr. Emery—Mr. President, in addition to my own statement, which is not under oath, but which I am willing to put under oath, I submit the testimony taken under oath of the gentlemen who were present at the consultation upon which this charge is based. I ask the Clerk to read two affidavits.

The affidavits were read as follows:

I, A. H. Logan, being duly sworn according to law, do depose and say: That the firm of Logan, Emery & Weaver, is a co-partnership, and the members thereof are A. H. Logan, Lewis Emery, Jr., and W. R. Weaver; that their business is refining, transporting, warehousing and dealing in petroleum, at Philadelphia and elsewhere; that as to the matter herein to be verified, this deponent came to know of sundry requests made through W. R. Weaver by officials of the Standard Oil Company, for a meeting with his firm in the summer of 1886. That this deponent consented to such meeting, and that he, with the other members of the firm, met with John D. Archbold and D. O'Day, at the Lafayette Hotel, in Philadelphia, where Mr. Emery was boarding, on September 24, 1886, where a proposition was made by the said John D. Archbold and D. O'Day to purchase our works complete; that the meeting was adjourned without definite conclusion, and that afterwards, viz: on the 30th day of September, under an appointment made by said Standard Oil Company officials, and without solicitation from us, we met them at the Albemarle Hotel, in New York, at which meeting Mr. Emery after consultation and with full knowledge of his partners, who being then present, agreed to name a sum or price at which we would sell the works, but the Standard Oil Company then declined a purchase entirely, and insisted upon a secret bonus arrangement which they claimed would be of great advantage. We were again asked to meet in conference by the Standard officials, and this meeting took place at the Astor House, in New York, early in November, when they offered \$22,500 per annum for five years, as consideration, if we would act in harmony with them. This arrangement, they asserted, would bring Mr. Emery in hearty accord with their organization, and all friction would cease. Our firm, all being present, declined assent, and Mr. Emery so stated to them; the conference then adjourned without conclusion and we considered the subject practically dropped.

This deponent further saith that he verily believes that he was present at every interview, and that in no instance was there any suggestion, intimation or agreement on the part of Mr. Emery that in concluding a sale, bargain or arrangement, he would in any way compromise or transfer his personal identity, independence or friendship, nor did he ever present to them his influence or co-operation as a factor in the case.

This deponent further saith that his first knowledge of any proposed legislation on the subject of oil was from a newspaper item which he cut out and mailed to Mr. Emery at Young's Hotel, Boston, January 28, 1887.

(Signed) A. H. LOGAN.

Subscribed and sworn to before me this 25th day of April, 1887.

[L. S.] H. R. SCHULTZ,

Notary Public.

Commonwealth of Pennsylvania, } ss.:
County of McKean.

Be it remembered, that on this 23d day of April, A. D. 1887, before me the subscriber, a notary public, in and for said county, personally came W. R. Weaver, who being duly sworn according to law, deposes and says: That the firm of Logan, Emery & Weaver are a co-partnership engaged in the business of refining petro-

leum oil, and is composed of A. H. Logan, Lewis Emery, Jr., and W. R. Weaver; that they are the owners of a refinery and works connected therewith in the city of Philadelphia; that in the summer of 1886 one of the officers of the Standard Oil Company came to him and asked if he could not make arrangements for a meeting between said firm of Logan, Emery & Weaver and representatives of the Standard Oil Company, for the purpose of considering the possibility of harmonizing certain matters in relation to their business, which were then antagonistic; that after a time, in accordance with said request, the said W. R. Weaver arranged for a meeting between said firm of Logan, Emery & Weaver and the representatives of said company; that at said meeting all of the members of said firm, to wit: A. H. Logan, Lewis Emery, Jr., and W. R. Weaver, were present, and two representatives of the Standard Oil Company; that said Standard Oil Company then requested Logan, Emery & Weaver to make them a proposition for the sale of their works; that after a consultation among themselves they submitted such a proposition, which the said representatives took under advisement and were to submit to the directors of said company. At a subsequent meeting, held at a hotel in the city of New York, at which were present the representatives of said Standard Oil Company and A. H. Logan, Lewis Emery, Jr., and W. R. Weaver, they declined to accept the proposition previously made; that at said meetings there was no talk about sale of personal goodwill or personal influence, and the entire matter of negotiation was exclusively a legitimate business transaction; that the said W. R. Weaver was present at all of said meetings, and that all that was said or done by Logan, Emery and Weaver, or either of them, was so said and done by them as affirmed, and related only to the business matters in which they were all interested; that so far as W. R. Weaver has any knowledge, Lewis Emery, Jr., has had no other meetings or transactions with said Standard Oil Company or any one representing them, and that at all of said meetings herein referred to the said Lewis Emery, Jr., only acted as a member of the firm of Logan, Emery & Weaver, and in no other capacity; that said meetings were all held at the request of said Standard Oil Company, and their agents came to said firm and met them at places outside of the offices of the said Standard Oil Company; that said firm of Logan, Emery & Weaver never had a meeting with said company in their offices, or entered the same before or since.

(Signed)

W. R. WEAVER.

Sworn to and subscribed before me this 22d day of April, 1887.

G. H. MOON,

[L. S.]

Notary Public.

Mr. Emery—Mr. President, I submit my own denial to those charges, as well as the denial under oath, of two gentlemen who were with me at the time of the meeting of the Standard Oil Company. Without any respect for my denial the Oil City *Derrick* and the Titusville *Herald*, two papers that receive a weekly or a monthly stipend from the Standard Oil Company, continue to defame, vilify, to crucify a man who occupies, as I believe, a worthy position in the hearts of his constituents. Those papers continue to vilify and malign my character. They have been sent, time and time again, with the marked articles of the "\$750,000 boodle taker, Senator Emery," and they have been scattered upon the desks of this Senate. They have been laid upon the desks of the House. They have been sent to every part of the country. They have been sent to

almost every friend and to every foe. The papers of Chicago, of San Francisco, of the Pacific coast and of the Atlantic coast, and the Middle States, have taken up this question. I have been belied and set forth to the world as a man who has not fulfilled his obligation and duty as a Senator and as a citizen.

Now, Mr. President, in the presence of one hundred and fifty men of my constituency, I ask if I have ever betrayed their trust? I submit if I have not in my seat defended the rights of that constituency. I submit that these papers have, at the expense of the Standard Oil Company, defamed me as a man; they have continually bored me from 1872 until the present time, have robbed me of my home two distinct and certain times, have continually followed me from 1872 until the present time, because I stood out in the defense of the people, and of their rights, and yet they are not satisfied. They now abuse a man occupying a seat in the Senate of Pennsylvania.

There sits upon that stool over there (pointing to Mr. Scheide), a man who has villified me upon the floor of this Senate; who has, over and over again, poured into the ears of Senators the falsehood that has come through the paper which he represents. But he has known, as I believe, that the statements were false, because he has known my character for the last nineteen years. I simply say that Mr. Scheide has no business to come upon this floor and use the argument against me that I am a "boodle taker." I say that he knows the statements are untrue, because he sat in this chair the other day and he said he believed they were untrue. Ah, he shakes his head now. I say, Mr. President and fellow Senators, I came upon this floor in 1879. I have been here continuously from that time to this. I submit to you, the friends with whom I have served, if you have ever known Lewis Emery, Jr., to go back upon his word; if you have ever known him to shirk his responsibility upon this floor; if you have ever known him to be for anything except for the best interest of the people? And yet this press, owned and controlled by this most infamous monopoly, that is greater than the East India Company of Great Britain, has defamed and villified me. This corporation has sapped the life blood of the people in that country, and thousands of them are not able to come here to-day and bear testimony that they want this measure passed, because they walk upon the soles of their feet, not upon shoes, because they are poverty stricken.

I stand here not alone, but with one hundred and fifty representatives of the oil producers beside me. I come here to ask that this monopoly shall no longer sap the life-blood from the people. Mr. President, it is not because the people in my district do not desire the passage of this bill—that is not the reason they are absent. It is because they have been stricken with poverty by this giant monopoly, and if they came here they would have to walk upon the soles of their feet. A fellow Senator who sits beside me says the Butler county producers are so poor that they cannot come here. And yet, because I am here advocating the cause of these people, I am defamed. I had the opportunity at the organization of this corporation to turn in my property to them. Hundreds of wealthy people did so. I stood out, and a few others have stood out honestly. Others have been taken in. Had I considered the question of dollars and cents I would have gone in with them. I have had the opportunity. I have been sought, not only once, as is set forth in these statements, but three or four times, if I would withdraw my opposition to this mammoth cor-

poration they would like to have peace and quiet. That is all they ask now—peace and quiet. I submit to you, fellow Senators, if my action before you has not been honorable. I care not for outsiders, but I ask those who have known me here for ten years if I have not walked in the straight path of duty?

I say, Mr. President, that these people have villified me through their paid press. This is hard language, but as true as there is a God in heaven. I stand here with my hand up before my Maker, to defend the language that has come from my lips. I stand here to defy these scandalous libelers. I am open to investigation anywhere on God's earth. I simply say that they are intruders upon the rights of the people.

I submit whether because I am here as a man trying to plead the cause of honest people, I should be subjected to the foul language of a paid press.

I simply say to these men who have come here and said that Lewis Emery, Jr., was working in his own interest, that it was a mere spite against the Standard Oil Company—if that be true, then I commenced fourteen years ago. I am to-day just exactly where I was fourteen years ago, at the organization of this mammoth corporation. I have thrown down the gauntlet, and I defy them to take it up. I know whereof I speak, and it is not only these men who sit here in this gallery from nine or ten counties of this State that are ready to say amen to what I say, but there are fifty thousand more. Bring them into court if you dare. I throw down the gauntlet for an investigation of your infamous practices, and here come ten, twenty or two hundred thousand people to say that Lewis Emery is right in his position, and I will defy you. I throw it in your teeth and dare you to take it up. The belt is off, the sword is drawn for battle if you dare to take it up. I look men in the face now that have said to me, "Emery, I do not believe these charges."

I submit to you if this thing should be continued? I am here in favor of a law that will give us some rights, and I simply say I should not be defamed for it.

Mr. President and Senators, thanking you for your attention, I feel that I have done my duty in defending myself, and now the courts are open if they want to take up this denial. I put it flat and straight—they are liars from the old house.

Comparative Statement.

STATISTICAL SUMMARY OF THE PETROLEUM SITUATION.

	1887. April.	1886. April.
Wells completed.....	169	353
New production.....	6,238	8,782
Dry holes.....	43	58
New rigs.....	79	247
Old rigs.....	119	140
Drilling wells.....	158	356
Total field operations.....	356	743
Average daily pipe line runs.....	65,072	64,228
Average daily shipments.....	60,988	69,127
Total stocks custody pipe lines.....	31,919,880	32,544,924
THE MARKET.		
Refined in New York.....	6%	7%
Opening price of crude for the month.....	63½	72%
Highest price of crude for the month.....	69	78½
Lowest price of crude for the month.....	62%	70%
Closing price of crude for the month.....	66¾	73½
Average price of crude for the month.....	64½	74

THE total exports of petroleum from America, in gallons, according to a German circular, from January 1 to April 8, for the years 1886 and 1887, have been as follows:

	1887. Gallons.	1886. Gallons.
To Europe.....	86,660,432	83,447,289
To East Indies, etc.....	29,305,464	44,267,340
Total.....	115,965,896	127,714,629

Crude Market for April.

No improvement in the condition of the crude market was effected during the month of April, and its course was very nearly as sluggish as in March. The defeat of the Billingsley bill in the Senate was made the pretext for a small advance toward the close of the month, which, however, seems to possess no satisfactory strength nor duration. There has been no material change in the situation in the field. Reibold showed a momentary increase over an extension to the southwest, while Washington maintained its production in a remarkable manner. The Standard seems to have determined to hold the market with a vigorous hand, and unless some decided change takes place it will soon be able to fix the price for Pennsylvania oil in the same way that it determines what price the Lima producer shall take for his product. As will be seen by the figures appended the volume of business in the several Exchanges, as revealed by the table of clearances, has become very small. They are typical of the dullness that has prevailed in the market for the past month.

The opening prices of the month were 63¼c and 63¾c. The market advanced to 66c on the 5th and to 66½c on the 9th. On the 20th of April it had fallen to 62½c which were the lowest figures for the month. It advanced to 69c on the 29th, which was the highest point, and the month wound up with quotations of 66½c, 66¼c and 66¾c. The highest price for March was 65¾c and the lowest 61¾c.

The range of prices for April was 6¾c as compared with 4c in March 9¾c in February, 4¾c in January, 16¾c in December, 14¾c in November, 4¾c in October and 4¾c in September. The average price on the floor of the Bradford Exchange was 64½c in April, 63¼c in March, 63¾c in February, 71c in January, 71c in December, 72c in November, 65½c in October, 63¾c in September, and 62c in August. The average price for April one year ago was 74c.

THE CLEARANCES.

	April. Barrels.	March. Barrels.
Bradford Oil Exchange.....	13,166,000	21,446,000
Oil City.....	31,312,000	33,460,000
New York Consolidated Exchange.....	82,902,000	97,743,000
Pittsburgh Petroleum Exchange, est.....	34,428,000	42,718,000
Philadelphia Oil Exchange, est.....	7,500,000	9,905,000
Total.....	169,308,000	205,272,000

The Average Price of Crude.

The following table gives the average price of crude certificates, on the floor of the Bradford Oil Exchange, since March 1, 1879:

MONTH.	1879	1880	1881	1882	1883	1884	1885	1886	1887
January.....	110 1-5	95	83	92½	111½	70¾	88¾	71	
February.....	103¼	89¼	85¼	101	104¾	73½	80	63¾	
March.....	86	89	82½	80¾	97½	100%	80¾	77½	63¾
April.....	78¾	76¾	84½	78¾	92¾	94	78¾	74	64½
May.....	73½	80¼	81½	70	99¾	85½	79¾	69¾	
June.....	68¾	100¼	81	54½	117½	68¾	82¼	67	
July.....	69¾	101¼	76½	57½	108	63½	96%	66	
August.....	67¼	90¾	78¾	58¾	108¾	81 1-5	100%	62	
September.....	69¼	9½	92¼	71¾	112½	78	100¾	63¾	
October.....	88¾	96¾	92¾	93¾	111½	71	105½	65½	
November.....	105¾	91¾	82½	114¾	114 4-5	72½	104¾	72	
December.....	113¾	92¾	83¾	95¼	114½	74¾	89¾	71	

THE gas well at Lancaster, Ohio, finds its supply in the Medina shale, and its estimated capacity is 75,000 cubic feet every twenty-four hours. Fremont gets its gas in the same rock.

THE Knoxville Natural Gas Company has been organized at Knoxville, Tenn. The officers of the company are: President, R. Z. Roberts; Vice-President, F. J. Leland; Secretary and Treasurer, C. M. Funck.

THE DEATH OF THE BILLINGSLEY BILL.

THE defeat of the Billingsley bill was consummated in the Senate of the Pennsylvania Legislature April 28, by a vote of 25 to 18, seven Senators from absence or other cause, not voting. No measure of recent date has received more attention on the part of the oil producer than this, and its utter failure was a crushing blow to the great number of oil men who saw in it an attempt to relieve them from a few of the burdens under which they have been laboring.

The Billingsley bill passed the House April 12 by the handsome vote of 132 to 39, and on both first and second readings passed in the Senate without opposition. Its annihilation on third reading was a preconcerted affair, and the friends of the bill, who had done so much energetic and faithful work in its behalf, were deluded into the belief that the bill was about to become a law up to almost the very last moment. But the contemptible treatment accorded to Senator Emery, when the bill was finally called up, on the morning of the 28th of April, proved conclusively that the oil country had nothing to expect from legislators, whose convictions were already fixed and who had determined to vote against the measure.

The vote of the Senate by ayes and noes is hereto appended for future reference:

AYES.

William McAleer, Philadelphia; a Democrat.
George Ross, Bucks; a Democrat.
Frank R. Brunner, Berks; a Democrat.
Henry R. Brown, Montgomery; a Republican.
Milton C. Henninger, Lehigh; a Democrat.
L. A. Watres, Luzerne; a Republican.
J. H. Shull, Monroe; a Democrat.
L. Emery, Jr., McKean; a Republican.
Gerard C. Brown, York; a Democrat.
William A. Martin, Adams; a Democrat.
W. W. Betts, Clearfield; a Democrat.
W. Scott Alexander, Fulton; a Republican.
George W. Hood, Indiana; a Republican.
J. H. Wilson, Clarion; a Democrat.
W. B. Meredith, Armstrong; a Republican.
John C. Newmyer, Allegheny; a Republican.
O. C. Allen, Warren; a Republican.
Emory A. Walling, Erie; a Republican.

NOES.

George Handy Smith, Philadelphia; a Republican.
Francis A. Osbourn, Philadelphia; a Republican.
John J. MacFarlane, Philadelphia; a Republican.
John E. Reyburn, Philadelphia; a Republican.
Boies Penrose, Philadelphia; a Republican.
John C. Grady, Philadelphia; a Republican.
Henry S. Taylor, Philadelphia; a Republican.
Thomas V. Cooper, Delaware; Chairman of Republican State Committee.
Amos H. Mylin, Lancaster; a Republican.
John M. Stehman, Lancaster; a Republican.
A. F. Thompson, Dauphin; a Republican.
Jacob Dachrodt, Northampton; a Democrat.
A. D. Harlan, Chester; a Republican.
V. H. Metzger, Lycoming; a Democrat.
O. A. Lines, Susquehanna; a Republican.
Luther R. Keefer, Schuylkill; a Democrat.
M. C. Watson, Schuylkill; a Democrat.
H. J. McAteer, Huntingdon; a Democrat.
Henry A. Boggs, Cambria; a Republican.
George F. Huff, Westmoreland; a Republican.
James S. Rutan, Allegheny; a Republican.

John Upperman, Allegheny; a Republican.
S. S. Steel, Allegheny; a Republican.
Samuel McClure, Mercer; a Republican.
George W. Delamater, Crawford; a Republican.

ABSENT.

J. P. S. Gobin, Lebanon; a Republican.
J. R. McLain, Beaver; a Republican.
J. K. Newell, Bradford and Wyoming; a Republican.
Thomas B. Schnatterly, Fayette; a Democrat.
Morgan B. Williams, Luzerne; a Republican.
S. P. Wolverton, Union; a Democrat.

DID NOT VOTE.

J. B. Sellheimer, Perry; a Democrat.

THE PRODUCERS' DELEGATES HOLD A MEETING.

Immediately after the defeat of the Billingsley bill in the Senate the delegates from the different producing fields held an important meeting at the Leland House, Harrisburg, at which the following resolutions were adopted and committees appointed:

Resolved, That the Billingsley bill has proved a talisman to oil producers in unifying and uniting hitherto discordant elements; has awakened producers to their actual situation; the necessity of combination for their protection, and has called the attention of the public to the wrongs, exactions and oppressions of the Standard Oil Company, and also established the fact that the Legislature of the State has the power to regulate, control, and if necessary for the public good, destroy this monster corporation.

Resolved, That our thanks are due and are hereby tendered to Hon. J. K. Billingsley for the introduction of the bill, its successful management by him and his unwearied care and attention to the same; to the members of the House who worked and voted for the measure and passed it by such an overwhelming majority, proving that this body at least is not under corporative or corruptive control; to Senators Emery, Walling and Newmyer, who spoke in our behalf, and to those who sustained and voted with them.

Resolved, That the people of the oil country have made a good fight, having stormed and almost taken the corporation citadel; that we continue to agitate until the people shall rule, and those who disgraced the Senate and the State of Pennsylvania are hurled from power.

The second series of resolutions are as follows:

WHEREAS, We, oil producers of Pennsylvania, have been oppressed by the greatest monopoly known in the history of the past or present, that is the Standard Oil Company, which has been permitted to infest all the highways over which our commerce has passed, and enforce tribute on our industry such as no despot has exacted from his subjects, in fact so great as to give this monopoly at present a profit per annum equal to the entire value of our property; and,

WHEREAS, We have appealed to our legislative bodies for legislation and no adequate relief has been granted; and,

WHEREAS, We have made a final appeal asking only a reasonable restriction of this tyrant power over our industry, and this right has been denied us by Senators who were elected to represent the people and not the corporations; and,

WHEREAS, The general Government has now granted us an anti-discrimination law which has heretofore been denied by our State, and which now, for the first time since the Standard's domination, will permit us to ship our commodity without paying enforced tribute. Now, therefore, be it

Resolved, That in order to protect our property and save, if possible, what yet remains, we recommend: First—A banding together, either in secret lodges or otherwise, of producers.

Resolved, Second—That it is the sense of this meeting that a co-operative joint stock company should at once be organized, embracing the people of the entire oil fields, the amount of the capital stock of said company to be hereafter arranged.

Resolved, That in order to complete this organization we recommend the appointment of two committees, one to call meetings in the various districts to send delegates to a general meeting at Oil City on Thursday next; the

other to present a plan of organization and plan for the formation of a co-operative company.

Two committees were appointed, one a district committee for the purpose of calling meetings to select delegates to send to a general meeting to be held in Oil City, Thursday, May 5, at 2 o'clock p. m., as follows:

Bradford—David Kirk, W. C. Kennedy, J. B. Farrell, C. B. Whitehead, L. E. Mallory.

Oil City—W. J. Innis, M. Byles, Wm. Hasson.

Warren—Col. L. F. Watson, Col. Gardner, Star Waters.

Titusville—S. P. Boyer, W. H. Andrews, J. A. Cadwalader.

Edenburgh—J. M. Brothers, D. O. White, E. G. Crawford.

Millerstown—W. A. Dennison, James Hartman, Jos. Showalter.

Bolivar—Harry Breckenridge, C. H. Rathbone, Riley Allen.

Butler—Dr. J. N. Bolard, T. W. Phillips, A. Leidecker.

Washington—Col. Dyer, R. H. Thayer, T. Knowlson.

The other committee to formulate a plan of organization is as follows:

T. W. Phillips, Chairman; William Hasson, David Kirk, S. P. Boyer, W. C. Kennedy.

The National Drill and Encampment at Washington.

The National Drill and Encampment, which opens in Washington May 23d, continuing until the 30th, will be one of the most interesting events that ever occurred in the history of America's militia. Its inception was the outgrowth of that general desire to make the volunteer military of the several States more effective, and as a step in that direction this competitive contest was arranged, and valuable prizes of cash, medals and trophies, offered as rewards for excellence in drill. Washington was very appropriately selected as the place, the citizens responded liberally, the War Department lent its aid, and the success of the enterprise is assured beyond any possibility of doubt. Over thirty of the States and Territories will be represented by military organizations, and the daily contests, embracing all the branches of military services from the manual of arms to brigade drill, will be intensely interesting to every one. The cash prizes amount to \$26,500. The camp will be pitched on the grounds surrounding the Washington Monument and the drill ground will be marked out on the campus between the Monument and the White House.

The universal interest which will be felt in the drill in all parts of the country, and the excellent opportunity it will afford for visiting the National Capital at the most beautiful season of the year, will draw thousands to Washington. The city, noted as the most beautiful capital of the world, never appears to so good an advantage as in the first blush of spring, nor is there any pleasanter time to visit the parks, gardens and public buildings than this. All the public property is open to the inspection of visitors.

In order to accommodate visitors the Pennsylvania Railroad Company will sell excursion tickets, May 21st to 27th, good to return until 30th, from all stations on its lines, at reduced rates. In addition special trains at special rates will be run on certain days from various sections of the Pennsylvania system, the details of which will be announced by posters and published in the newspapers.

The Refined Market.

The refined market has been fairly active for the season of the year. Low freight rates as a general rule prevailed throughout the month, creating a very lively demand both at the Philadelphia and New York ports.

Nearly all the sales of the month were made on a basis of 6½¢ for 70° Abel test, for the three leading places of export. On the 30th there was an advance to 6¾¢ in sympathy with the improvement in the crude market.

The exports of refined, crude and naphtha, from all ports, from January 1 to April 30 have been as follows:

	1887. Gallons.	1886. Gallons.
From Boston.....	1,698,710	1,596,123
Philadelphia.....	38,688,645	39,040,154
Baltimore.....	1,895,689	3,920,976
Perth Amboy.....	4,730,342	1,096,444
Total.....	47,013,386	45,653,697
From New York.....	108,583,219	120,513,169

Total exports from United States.....155,599,605 166,166,866

Refined for the home trade is in less demand, with large quantities offered, but no variations in the quotations, which remain as follow: 8@8½¢ for New York State legal test, 7@7¼¢ for 110° test, 8@8¼¢ for New York city 110° flash, and 9@9¼¢ for New York city 150° water white. Western lots are offered at 6¾¢@7¢ for 110° test Standard white, 7¼¢@7½¢ for 120° test Standard white, 7½¢@7¾¢ for 130° test Standard white, and 8¾¢@9¢ for 150° test water white. Western naphtha 68° to 72° test is quoted at 7½¢@8¢ delivered in New York.

The demand for refined in cases has continued in active demand and prices have been advanced to 8½¢ for plain tops. The clearances for April in this class of goods to China and the East amounts to 1,085,363 cases, an increase of 342,885 cases over the same month in 1886. The total clearances to April 30, 1887, are 3,568,033 cases, a decrease of 1,532,575 cases, as compared with the corresponding period of the year preceding.

Mr. George H. Lincoln's monthly circular gives the following figures on the clearances of refined petroleum, in cases, for China and the East up to the 30th of April, for the years 1886 and 1887:

	1887. Cases.	1886. Cases.
China.....	781,568	1,774,088
Japan.....	935,127	731,123
India.....	1,169,260	1,326,334
Java, Singapore, etc.....	682,078	1,269,063
Total April 30th.....	3,568,033	5,100,608
Total March 31st.....	2,482,670	4,358,130
Clearances for April.....	1,085,363	742,478
Clearances for March.....	1,157,823	2,058,609
Clearances for February.....	733,626	1,281,488
Clearances for January.....	591,221	1,018,033
Total.....	3,568,033	5,100,608

REFINED QUOTATIONS FOR APRIL.

	New York.....	Philadelphia.....	Baltimore.....	London and Liverpool.....	Bremen.....	Antwerp.....
	Cts.	Cts.	Cts.	Pence.	Marks.	Francs
1.....	6½	6½	6½	5½	5.95	15½
2.....	6½	6½	6½	5½	5.95	15½
3.....	6½	6½	6½	5½	5.90	15½
4.....	6½	6½	6½	5½	5.90	15½
5.....	6½	6½	6½	5½	5.90	15½
6.....	6½	6½	6½	5½	5.90	15½
7.....	6½	6½	6½	5½	6.00	15½
8 Holiday.....	6½	6½	6½	5½	6.00	15½
9.....	6½	6½	6½	5½	6.00	15½
10.....	6½	6½	6½	5½	6.00	15½
11.....	6½	6½	6½	5½	6.00	15½
12.....	6½	6½	6½	5½	6.00	15½
13.....	6½	6½	6½	5½	6.00	15½
14.....	6½	6½	6½	5½	6.00	15½
15.....	6½	6½	6½	5½	6.00	15½
16.....	6½	6½	6½	5½	6.00	15½
17.....	6½	6½	6½	5½	6.00	15½
18.....	6½	6½	6½	5½	6.00	15½
19.....	6½	6½	6½	5½	6.00	15½
20.....	6½	6½	6½	5½	6.00	15½
21.....	6½	6½	6½	5½	6.00	15½
22.....	6½	6½	6½	5½	6.00	15½
23.....	6½	6½	6½	5½	5.95	15½
24.....	6½	6½	6½	5½	5.95	15½
25.....	6½	6½	6½	5½	5.95	15½
26.....	6½	6½	6½	5½	5.95	15½
27.....	6½	6½	6½	5½	5.95	15½
28.....	6½	6½	6½	5½	5.95	15½
29.....	6½	6½	6½	5½	6.00	15½
30.....	6½	6½	6½	5½	6.00	15½

NATURAL GAS COMPANIES IN OHIO.

LIST OF INCORPORATIONS SINCE NOVEMBER 15, 1886.

The best possible index of the interest manifested by Ohio capitalists in the development of natural gas territory is shown by the number of companies incorporated in this State during the past few months, and the amount of capital authorized for such projects. An inspection of the books of the Secretary of State, at Columbus, shows that since November 15, 1886, when the fiscal year of the State closed, there had been incorporated up to and including April 19, no less than 93 companies for the purpose of drilling or boring for natural gas and oil, with an aggregate capital stock of \$5,489,975. The accompanying list shows that the activity in this line is confined to no section, but extends generally throughout the State:

Barnesville Oil and Naphtha Gas Co., Barnesville.....	\$ 20,000
Seneca Oil and Pipe Line Co., Tiffin.....	25,000
Waldo Oil and Gas Co., Waldo.....	7,000
Circleville Natural Gas and Oil Co., Circleville.....	5,000
Cleveland & Pittsburgh Natural Gas Co., Cleveland.....	100,000
Oil and Gas Prospecting Co., Fremont.....	5,000
Prairie Oil and Natural Gas Co., Kenton.....	25,000
Tiffin Fuel, Gas and Pipe Line Co., Tiffin.....	80,000
Vanlue Natural Gas Co., Vanlue.....	5,000
Northwestern Ohio Natural Gas and Petroleum Oil Co., Dayton.....	500,000
Rossville Oil and Gas Co., Rossville.....	5,000
Citizens' Gas Co., Bowling Green.....	100,000
Genesee Oil Co., Findlay.....	50,000
Fostoria Gas Fuel Co., Fostoria.....	50,000
Seneca Oil and Gas Co., Tiffin.....	20,000
Cardington Oil and Gas Co., Cardington.....	3,000
Natural Gas and Fuel Co., Cleveland.....	250,000
Natural Gas and Oil Development Co., Toledo.....	40,000
Farmers' Natural Gas and Oil Co., Millbury.....	50,000
London Natural Gas and Coal Oil Co., London.....	5,000
McComb Oil and Gas Co., McComb.....	2,000
Franklin Gas and Oil Co., Sunbury.....	10,000
Jamestown Natural Gas and Oil Co., Jamestown.....	3,000
Canal Winchester Natural Gas and Oil Co., Canal Winchester.....	5,000
Provident Natural Gas and Oil Co., Bucyrus.....	30,000
Holgate & Defiance Oil, Gas and Mineral Co., Holgate.....	10,000
White House Natural Gas and Oil Co., White House.....	5,000
People's Natural Gas Co., Oak Harbor.....	4,000
Pemberville Gas and Oil Co., Pemberville.....	26,000
St. Joe Oil and Gas Co., Edgerton.....	10,000
Paulding Oil and Gas Co., Paulding.....	5,000
Farmers' Gas, Oil and Pipe Line Co., Weston.....	24,000
Sherman Oil and Gas Co., Toledo.....	300,000
Canton Oil, Gas and Coal Co., Canton.....	10,000
Mt. Gilead Natural Gas and Oil Co., Mt. Gilead.....	3,000
Nickel Plate Oil and Gas Co., Me rose.....	5,000
J. B. Hobler Gas and Oil Co., Mansfield.....	6,000
Highland Natural Gas and Oil Co., Hillsborough.....	3,500
Oberlin Natural Gas Co., Oberlin.....	10,000
Hilliard Gas and Oil Co., Hilliard.....	4,000
Adams County Gas and Oil Co., Manchester.....	3,000
Miamisburg Gas and Petroleum Co., Miamisburg.....	5,000
Felicity Ohio Gas and Oil Co., Felicity.....	1,875
Elyria Natural Gas Co., Elyria.....	10,000
Citizens' Natural Gas and Oil Co., Dayton.....	3,000
Sparta Gas, Oil and Coal Co., Sparta.....	5,000
Alaska Oil and Natural Gas Co., Archbald.....	50,000
North Baltimore Gas Co., Findlay.....	25,000
Gilboa Oil and Gas Co., Gilboa.....	10,000
Cadiz Oil and Natural Gas Co., Cadiz.....	10,000
Central Ohio Natural Gas and Oil Co., Delaware.....	4,000
Citizens' Oil and Gas Co., DeGraff.....	2,500
Ohio Natural Gas and Oil Co., Toledo.....	750,000
Miami Natural Gas Co., Dayton.....	2,000,000
Galvin Natural Gas and Oil Co., Galvin.....	2,400
Mannee Valley Gas and Oil Co., South Toledo.....	4,000
Carroll Natural Gas and Oil Co., Carroll.....	4,000
Fountain City Oil and Gas Co., Bryan.....	20,000
Chillicothe Natural Gas and Oil Co., Chillicothe.....	10,000
Stryker Oil and Gas Co., Stryker.....	25,000
Bedford Drilling Co., Bedford.....	10,000
Williams County Gas and Oil Co., Bryan.....	21,000
Montpelier Oil and Gas Co., Montpelier.....	5,000
Oxford Natural Gas and Oil Co., Oxford.....	5,000
Black Swamp Oil and Natural Gas Co., Toledo.....	10,000
Produce Exchange Oil and Gas Co., Toledo.....	100,000
Holgate Oil and Gas Co., Holgate.....	5,000
New London Gas, Oil and Pipe Line Co., New London.....	2,500
Fayette Natural Oil and Gas Co., Fayette.....	3,200
Hamilton Natural Gas and Oil Co., Hamilton.....	25,000
Amanda Natural Gas and Oil Co., Amanda.....	5,000
Ridge Natural Gas and Oil Co., Carey.....	10,000
Warren Gas and Oil Co., Barnesville.....	5,000
Northville Natural Gas and Oil Co., Northville.....	20,000
West Hamilton Natural Gas and Oil Co., Hamilton.....	2,000
Mather's Gas and Oil Co., Toledo.....	40,000
Lebanon Natural Gas and Oil Co., Lebanon.....	3,000
Middletown Natural Gas Co., Middletown.....	40,000
Mt. Pleasant Gas and Oil Co., Lancaster.....	5,000
Wilmington Natural Gas and Oil Co., Wilmington.....	25,000
Dayton Natural Gas Co., Dayton.....	10,000
Rocky Ford Natural Gas and Oil Co., Toledo.....	10,000
Manhattan Gas and Oil Co., Toledo.....	100,000

Tomochtee Natural Gas and Oil Co., Kenton.....	5,000
Champaign Natural Gas and Oil Co., Urbana.....	25,000
Peerless Refining Co., Cleve and.....	100,000
Alliance Gas and Oil Co., Alliance.....	5,000
Greenfield Natural Gas and Oil Co., Greenfield.....	3,000
Reading Natural Gas and Oil Co., Reading.....	5,000
Tontogany Natural Gas and Oil Co., Tontogany.....	20,000
Van Wert City Natural Gas and Oil Co., Van Wert.....	50,000
Mt. Orab Natural Gas and Oil Co., Mt. Orab.....	3,000

It should be stated, perhaps, that the great majority of these companies were organized for testing purposes, hence the small amount of capital stock authorized.

During the fiscal year ended November 15, 1886, there were incorporated in Ohio 89 natural gas and oil companies, with an aggregate capital stock of \$3,770,000. Thus, during a period of less than sixteen months, 182 companies of this description have been incorporated in Ohio, their aggregate capital stock being \$9,262,975.—*Iron Trade Review*.

Runs, Shipments and Stocks.

RUNS OR RECEIPTS.

PIPE LINE.	APRIL, 1887.	MAR., 1887.
National Transit Co.....	1,345,877.49	1,376,756.07
Tidewater.....	177,683.06	180,639.79
Octave Oil Co.....	2,527.00	3,337.00
Keystone Pipe Line.....	28,034.68	30,337.29
Pittsburgh Pipe Line.....	98,409.62	95,943.70
Southwest Pennsylvania.....	299,628.44	294,356.34

Total.....	1,952,160.29	1,981,370.19
Daily average.....	65,072.00	63,915.17

In the above runs only the oil received by the National Transit Co. directly from the wells, is included.

DELIVERIES OR SHIPMENTS.

PIPE LINE.	APRIL, 1887.	MAR., 1887.
National Transit Co.....	1,601,351.25	1,932,299.54
Tidewater.....	193,167.99	218,860.50
Octave Oil Co.....	1,797.00	2,003.00
Keystone Pipe Line.....	19,897.59	29,528.99
Pittsburgh Pipe Line.....	98,825.59	95,126.69
Southwest Pennsylvania.....	234,550.18	340,200.29

Total.....	2,149,589.60	2,618,019.01
Less oil transferred between lines.....	319,933.02	389,151.60

Total.....	1,829,656.58	2,228,867.41
Daily average shipments.....	60,988.55	71,898.95

In the above shipments only the oil delivered to refiners is included.

Daily excess of runs over shipments, April.....	4,083.45
Daily excess of shipments over runs, March.....	7,983.78
Daily excess of shipments over runs, February.....	3,564.10
Daily excess of shipments over runs, January, 1887.....	8,702.88
Daily excess of shipments over runs, December.....	11,270.81
Daily excess of shipments over runs, November.....	10,818.54
Daily excess of shipments over runs, October.....	580.75
Daily excess of runs over shipments, September.....	8,057.13
Daily excess of runs over shipments, August.....	11,931.56
Daily excess of runs over shipments, July.....	5,557.20
Daily excess of runs over shipments, June.....	4,793.41
Daily excess of runs over shipments, May.....	3,967.06
Daily excess of shipments over runs, April.....	4,899.20
Daily excess of shipments over runs, March.....	4,561.80
Daily excess of runs over shipments, February.....	14,701.52
Daily excess of shipments over runs, January, 1886.....	7,825.68

NET STOCKS.

PIPE LINE.	APRIL 30, 1887.	MAR. 31, 1887.
National Transit Co.....	29,149,380.09	29,149,058.26
Tidewater.....	1,556,305.60	1,519,065.93
Octave Oil Co.....	4,028.00	2,961.00
Keystone Pipe Line.....	32,666.12	23,063.14
Pittsburgh Pipe Line.....	4,460.64	4,876.61
Southwest Pennsylvania.....	1,173,039.23	1,107,960.97

Total	31,919,879.68	31,806,985.91
Stocks increased April		112,893.77
Stocks decreased March		257,699.31
Stocks decreased February		105,988.75
Stocks decreased January, 1887		777,975.85
Stocks decreased December		357,196.56
Stocks decreased November		286,526.86
Stocks decreased October		1,790.72
Stocks increased September		214,073.99
Stocks increased August		362,652.56
Stocks increased July		188,510.62
Stocks increased June		216,583.97
Stocks increased May		110,800.44
Stocks decreased April 1886		165,635.61

RECEIPTS. DELIVERIES.

Daily average April.....	65,072	60,988
Daily average March.....	63,915	71,899
Daily average February.....	63,374	66,938
Daily average January, 1887.....	62,629	71,332
Daily average December.....	67,857	79,127
Daily average November.....	70,767	81,586
Daily average October.....	76,019	76,600
Daily average September.....	77,989	69,932
Daily average August.....	76,880	64,949
Daily average July.....	74,880	69,323
Daily average June.....	75,811	71,017
Daily average May.....	68,602	64,635
Daily average April 1886.....	64,223	69,127

NOTE—The above figures are in barrels of 42 gallons each, and include only the pipe lines of the New York and Pennsylvania oil regions.

Stocks Abroad.

Reports of stocks in London, and the seven principal Continental ports, are summarized in the following statement:

STOCKS AFLOAT AND ASHORE.	April 23, 1887.	Mar. 19, 1887.
Seven Continental Ports.....	563,959	528,042
London.....	130,836	171,124
Total Stocks afloat and ashore.....	694,795	699,166
Decrease in stocks since March 19.....	4,379	

A detailed statistical table giving the stocks on hand, the stocks in vessels on the ocean, and the amount unloading from the vessels at the different ports, is appended, which shows at a glance the condition of affairs abroad and the increase or decrease as compared with the corresponding period of 1886. The shipments represent the amount of oil going to the interior of Europe from the seaports:

STOCKS IN FOREIGN PORTS APRIL 23, 1887.

PORTS.	Stocks week ending April 23.		Stocks afloat week ending April 23.		Loading. Week ending April 23.		Grand total stocks afloat and loading.		Receipts From July 1.		Shipments from July 1.	
	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.
London.....	61,429	111,436	19,473	19,400	37,200	-----	118,102	130,836	558,986	577,397	600,790	653,861
Bremen.....	114,664	65,692	57,759	23,129	30,600	15,700	203,023	104,521	496,329	585,164	829,735	730,558
Hamburg.....	102,945	33,739	33,156	69,865	48,900	57,400	185,001	166,004	801,550	759,618	869,439	875,744
Antwerp.....	101,516	22,667	41,003	57,946	52,000	26,000	194,519	106,613	829,363	706,411	839,264	844,745
Rotterdam.....	36,056	19,370	12,844	58,504	33,400	14,000	82,300	91,874	361,287	433,833	394,118	496,404
Amsterdam.....	26,535	5,263	32,036	33,946	6,000	-----	64,571	39,209	236,090	200,221	236,926	262,436
Stettin.....	12,067	14,711	6,492	14,051	-----	14,700	18,559	43,462	242,902	305,297	289,247	306,479
Danzig.....	4,357	12,276	-----	-----	-----	-----	4,357	12,276	58,858	54,945	69,765	71,906
Total.....	398,140	178,718	183,290	257,441	170,900	127,800	752,330	563,959	3,026,329	3,045,489	3,528,494	3,588,572

Total stocks Continental Ports	1884.	1885.	1886.	1887.
	Barrels.	Barrels.	Barrels.	Barrels.
Total afloat,.....	1,066,042	572,114	398,140	178,718
Total loading.....	242,381	170,318	183,290	257,441
Total.....	1,558,000	163,600	170,900	127,800
Afloat and loading for direct Continental Ports.....	1,464,223	906,032	752,330	563,959
“ “ “ Baltic Sea, exclusive Stettin and Danzig.....	25,900	8,000	8,000	11,500
“ “ “ Total Continental Ports.....	21,600	18,800	29,300	24,600
“ “ “ Total London.....	1,485,823	950,732	789,630	600,059
“ “ “ English harbors, exclusive London.....	279,587	132,272	118,102	130,836
Grand total.....	33,500	18,800	54,200	
	1,765,410	1,116,504	926,532	785,095

OFFICIAL STATEMENT—EXPORTS OF PETROLEUM, MARCH, 1887.

BY WM. F. SWITZLER, CHIEF OF BUREAU OF STATISTICS, WASHINGTON, D. C., APRIL 9, 1887.

CUSTOMS DISTRICTS	MINER'L, CRUDE		NAPHTHAS		ILLUMINATING.		LUBRICATING & PARAFFINE OILS.		RESIDUUM.		TOTAL.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Boston and Charlestown, Mass.....			2,000	640	288,604	26,229	7,020	1,418			297,624	28,287
New York, N. Y.....	1,976,888	135,591	269,637	28,813	25,886,146	2,097,545	2,213,919	382,310	256,620	11,816	30,603,210	2,656,075
Philadelphia, Pa.....	2,448,721	160,117	213,459	16,810	9,006,359	639,257	39,544	5,411			11,708,083	821,595
Baltimore, Md.....					310,684	20,185			189,504	8,800	500,188	28,985
Total for Mar., 1887..	4,425,609	295,708	485,093	46,263	35,491,793	2,783,216	2,260,483	389,139	446,124	20,616	43,109,105	3,534,942
Total for Mar., 1886..	5,932,415	420,471	793,712	71,828	36,981,277	3,112,353	1,094,729	219,447	3,150	295	44,805,283	3,824,394
Total for 9 months ending Mar. 31, 1887..	60,115,810	3,849,886	12,699,566	1,116,507	342,180,234	26,625,985	12,659,222	2,321,036	1,983,400	97,590	429,638,232	34,011,004
Total for 9 months ending Mar. 31, 1886..	62,389,521	4,653,775	10,201,532	803,840	342,170,881	30,150,837	8,857,813	1,790,398	2,553,474	150,681	426,173,221	37,549,531

CRUDE QUOTATIONS FOR APRIL, 1887.

Day of Month and week.	BRADFORD.				OIL CITY.				NEW YORK.				PITTSBURGH.			
	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed
F 1.....	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{1}{4}$	63 $\frac{1}{4}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{1}{4}$	63 $\frac{1}{4}$	63 $\frac{1}{4}$	63 $\frac{3}{8}$	63 $\frac{1}{4}$	63 $\frac{1}{4}$
S 2.....	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$
M 4.....	63 $\frac{5}{8}$	63 $\frac{5}{8}$	63 $\frac{1}{2}$	63 $\frac{1}{2}$	63 $\frac{1}{2}$	63 $\frac{5}{8}$	63 $\frac{1}{2}$	63 $\frac{1}{2}$	63 $\frac{5}{8}$	63 $\frac{5}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{1}{2}$	63 $\frac{5}{8}$	63 $\frac{1}{2}$	63 $\frac{1}{2}$
T 5.....	63 $\frac{1}{2}$	66	63 $\frac{1}{2}$	65 $\frac{3}{8}$	63 $\frac{1}{2}$	65 $\frac{3}{8}$	63 $\frac{1}{2}$	65 $\frac{3}{8}$	63 $\frac{1}{2}$	66	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{1}{2}$	65 $\frac{3}{8}$	63 $\frac{1}{2}$	65 $\frac{3}{8}$
W 6.....	65 $\frac{3}{8}$	65 $\frac{3}{8}$	64	64 $\frac{1}{2}$	65 $\frac{3}{8}$	65 $\frac{3}{8}$	64 $\frac{1}{2}$	64 $\frac{1}{2}$	65 $\frac{3}{8}$	65 $\frac{3}{8}$	64	64 $\frac{1}{2}$	65 $\frac{3}{8}$	65 $\frac{3}{8}$	64	64 $\frac{1}{2}$
T 7.....	64 $\frac{1}{4}$	64 $\frac{1}{2}$	64	64 $\frac{1}{2}$	64 $\frac{1}{4}$	64 $\frac{1}{2}$	64 $\frac{1}{4}$	64 $\frac{1}{4}$	64	64 $\frac{1}{2}$	64	64 $\frac{1}{4}$	64 $\frac{1}{4}$	64 $\frac{1}{2}$	64 $\frac{1}{4}$	64 $\frac{1}{4}$
F 8 Holiday.																
S 9.....	64 $\frac{1}{4}$	66 $\frac{1}{4}$	64 $\frac{1}{4}$	65 $\frac{5}{8}$	64 $\frac{1}{2}$	66 $\frac{1}{8}$	64 $\frac{3}{8}$	65 $\frac{5}{8}$	64 $\frac{1}{4}$	66 $\frac{1}{8}$	64 $\frac{1}{4}$	65 $\frac{5}{8}$	64 $\frac{1}{8}$	66 $\frac{1}{8}$	64 $\frac{3}{8}$	65 $\frac{5}{8}$
M 11.....	65 $\frac{3}{8}$	65 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	65 $\frac{1}{4}$	64 $\frac{3}{8}$	64 $\frac{1}{2}$	65 $\frac{3}{8}$	65 $\frac{3}{8}$	64	64 $\frac{1}{2}$	65 $\frac{1}{4}$	65 $\frac{1}{4}$	64 $\frac{1}{2}$	64 $\frac{1}{2}$
T 12.....	64 $\frac{1}{4}$	65 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{1}{4}$	65 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{1}{2}$	65 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	65 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$
W 13.....	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{1}{4}$	64 $\frac{1}{4}$	64 $\frac{3}{8}$	65	64 $\frac{3}{8}$	64 $\frac{1}{2}$	64 $\frac{3}{8}$	65	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	65	64 $\frac{3}{8}$	64 $\frac{3}{8}$
T 14.....	64 $\frac{1}{2}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$
F 15.....	64 $\frac{1}{2}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$
S 16.....	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$	64 $\frac{3}{8}$
M 18.....	64 $\frac{1}{2}$	64 $\frac{1}{2}$	63	63 $\frac{1}{4}$	64 $\frac{1}{2}$	64 $\frac{3}{8}$	63	63	64 $\frac{5}{8}$	64 $\frac{3}{8}$	63	63 $\frac{1}{4}$	64 $\frac{3}{8}$	64 $\frac{1}{2}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$
T 19.....	63 $\frac{3}{8}$	63 $\frac{3}{8}$	62 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	62 $\frac{7}{8}$	63 $\frac{3}{4}$	63 $\frac{3}{4}$	63 $\frac{3}{8}$	62 $\frac{7}{8}$	63 $\frac{3}{4}$	63 $\frac{3}{4}$	63 $\frac{3}{8}$	62 $\frac{7}{8}$	63 $\frac{3}{8}$
W 20.....	63 $\frac{3}{8}$	64 $\frac{1}{2}$	62 $\frac{3}{8}$	62 $\frac{3}{4}$	63 $\frac{3}{4}$	64 $\frac{1}{2}$	62 $\frac{3}{4}$	62 $\frac{3}{4}$	63 $\frac{3}{4}$	64 $\frac{1}{2}$	62 $\frac{3}{4}$	62 $\frac{3}{4}$	63 $\frac{3}{4}$	64 $\frac{1}{2}$	62 $\frac{3}{4}$	63 $\frac{3}{4}$
T 21.....	63	63 $\frac{1}{4}$	63	63	63 $\frac{3}{8}$	63 $\frac{3}{8}$	62 $\frac{3}{8}$	63 $\frac{3}{8}$	62 $\frac{3}{8}$	63 $\frac{3}{4}$	62 $\frac{3}{8}$	63	63 $\frac{3}{8}$	63 $\frac{3}{4}$	63	63 $\frac{3}{8}$
F 22.....	63	63	62 $\frac{3}{8}$	62 $\frac{3}{8}$	62 $\frac{3}{8}$	63 $\frac{3}{8}$	62 $\frac{3}{8}$	63	63	63	62 $\frac{3}{8}$	63	63	63 $\frac{3}{8}$	62 $\frac{3}{8}$	63 $\frac{3}{8}$
S 23.....	63	63 $\frac{3}{8}$	63	63 $\frac{3}{8}$	63	63 $\frac{3}{8}$	63	63 $\frac{3}{8}$	63	63 $\frac{3}{8}$	63	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$
M 25.....	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{1}{2}$	63 $\frac{3}{4}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{1}{2}$	63 $\frac{3}{8}$	63 $\frac{1}{2}$	63 $\frac{3}{8}$
T 26.....	63 $\frac{3}{8}$	64 $\frac{1}{4}$	63 $\frac{3}{8}$	64 $\frac{1}{4}$	63 $\frac{3}{8}$	64 $\frac{1}{4}$	63 $\frac{3}{8}$	64 $\frac{1}{4}$	63 $\frac{3}{8}$	64 $\frac{1}{4}$	63	64 $\frac{1}{4}$	63 $\frac{3}{8}$	64 $\frac{1}{4}$	63 $\frac{3}{8}$	64 $\frac{1}{4}$
W 27.....	64	65 $\frac{1}{8}$	64	64 $\frac{3}{8}$	64 $\frac{3}{8}$	65 $\frac{1}{8}$	64 $\frac{3}{8}$	65 $\frac{1}{8}$	64 $\frac{3}{8}$	65 $\frac{1}{8}$	64	65 $\frac{1}{8}$	64 $\frac{3}{8}$	65 $\frac{1}{8}$	64 $\frac{3}{8}$	65
T 28.....	65 $\frac{1}{8}$	68 $\frac{1}{4}$	65 $\frac{1}{8}$	67 $\frac{1}{2}$	65 $\frac{1}{8}$	68 $\frac{1}{4}$	65 $\frac{1}{8}$	67 $\frac{1}{2}$	65 $\frac{1}{8}$	68	65 $\frac{1}{4}$	67 $\frac{1}{2}$	65 $\frac{1}{8}$	68 $\frac{1}{4}$	65 $\frac{1}{8}$	67 $\frac{1}{2}$
F 29.....	67 $\frac{1}{2}$	68 $\frac{3}{4}$	67 $\frac{1}{2}$	67 $\frac{1}{2}$	67 $\frac{1}{2}$	68 $\frac{3}{4}$	67 $\frac{1}{2}$	68	67 $\frac{1}{2}$	68 $\frac{3}{4}$	67 $\frac{1}{2}$	67 $\frac{1}{2}$	67 $\frac{1}{2}$	69	67	68
S 30.....	68 $\frac{3}{4}$	68 $\frac{3}{4}$	66 $\frac{1}{2}$	66 $\frac{1}{2}$	68 $\frac{3}{4}$	68 $\frac{3}{4}$	66 $\frac{1}{2}$	66 $\frac{1}{2}$	68	68 $\frac{3}{4}$	66	66 $\frac{1}{2}$	68 $\frac{3}{4}$	68 $\frac{3}{4}$	66 $\frac{1}{2}$	66 $\frac{1}{2}$

FIELD OPERATIONS SUMMARIZED.

WELLS COMPLETED, WITH THE ESTIMATED PRODUCTION ON THE LAST DAY OF THE MONTH.

ALLEGANY FIELD.

Division of Field.	APRIL, 1887.			MARCH, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Seio.....	0	0	0	1	4	0
Alma.....	1	3	0	0	0	0
Wirt.....	2	14	0	1	0	1
Bolivar.....	0	0	0	0	0	0
Clarksville.....	0	0	0	5	25	0
Genesee.....	0	0	0	0	0	0
Miscellaneous.....	0	0	0	1	0	1
Total.....	3	17	0	8	29	2

BRADFORD FIELD.

Division of Field.	APRIL, 1887.			MARCH, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
E. and W. Branches.....	3	10	1	4	18	1
Kendall Creek.....	0	0	0	0	0	0
Foster Brook.....	1	8	0	1	10	0
Knapp's Creek.....	3	16	0	0	0	0
Four Mile.....	1	5	0	0	0	0
Indian & Meeks Creeks.....	3	21	0	1	5	0
Cole Creek.....	1	12	0	1	20	0
Kinzua.....	4	26	1	1	10	0
Miscellaneous.....	0	0	0	1	0	1
Total.....	16	98	2	9	63	2

WARREN AND FOREST.

District.	APRIL, 1887.			MARCH, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Glade.....	8	93	3	4	150	1
Clarendon.....	10	44	0	6	24	1
Tiona.....	5	28	0	8	42	0
Cooper.....	1	10	0	0	0	0
Balltown.....	2	8	1	2	15	0
Kane.....	1	5	0	1	5	0
Grand Valley.....	17	125	4	5	30	1
Miscellaneous.....	8	59	2	6	15	4
Total.....	52	372	10	32	291	7

LOWER COUNTRY.

District.	APRIL, 1887.			MARCH, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Venango.....	37	163	17	27	90	16
Clarion.....	8	60	3	10	85	3
Butler and Armstrong.....	25	3310	2	29	1162	9
Washington.....	18	2148	1	10	1152	1
Shoustown, Etc.....	10	70	7	8	925	4
Total.....	98	5751	31	84	3414	33

GRAND SUMMARY.

District.	APRIL, 1887.			MARCH, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Allegany.....	3	17	0	8	29	2
Bradford.....	16	98	2	9	63	2
Warren and Forest.....	52	372	10	32	291	7
Lower Field.....	98	5751	31	84	3414	33
Total April.....	169	6238	43	133	3787	44
Total March.....	133	3787	44			
Difference.....	36	2451	1			

Rigs Up and Building—Wells Drilling.

ALLEGANY FIELD.

Division of Field.	APRIL 30, 1887.				MARCH 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Seio.....	0	4	1	5	0	4	0	4
Alma.....	0	5	0	5	0	5	1	6
Wirt.....	1	9	1	11	0	9	2	11
Bolivar.....	0	2	1	3	0	2	0	2
Genesee.....	0	0	0	0	0	0	0	0
Clarksville.....	2	5	1	8	1	5	0	6
Miscellaneous.....	0	0	1	1	0	0	0	0
Total.....	3	33	5	41	1	33	3	37

BRADFORD FIELD.

Division of Field.	APRIL 30, 1887.				MARCH 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
E. and W. Branches.....	1	9	4	14	2	9	3	14
Kendall Creek.....	0	0	0	0	0	0	0	0
Knapp's Creek.....	0	5	1	6	0	6	2	8
Foster Brook.....	2	4	2	8	1	4	0	5
Four Mile.....	0	3	1	4	0	3	0	3
Indian Creek.....	3	1	2	6	1	3	3	7
Cole Creek.....	0	5	2	7	1	5	1	7
Kinzua.....	2	0	4	6	1	1	3	5
Miscellaneous.....	0	0	0	0	0	0	0	0
Total.....	8	27	16	51	8	30	12	50

WARREN AND FOREST.

Division of Field.	APRIL 30, 1887.				MARCH 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Glade.....	7	0	7	14	6	0	6	12
Clarendon.....	3	5	9	17	6	6	6	18
Tiona.....	1	1	2	4	1	1	2	4
Cooper.....	0	0	0	0	0	0	0	0
Balltown.....	1	2	1	4	0	2	2	4
Kane.....	0	4	1	5	0	4	2	6
Grand Valley.....	12	3	10	25	8	3	9	20
Miscellaneous.....	3	3	10	16	3	4	12	19
Total.....	27	21	40	88	18	22	39	79

LOWER COUNTRY.

Division of Field.	APRIL 30, 1887.				MARCH 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Venango.....	18	14	20	52	13	13	24	50
Clarion.....	2	7	9	18	9	7	7	23
Butler & Armstrong.....	20	5	27	52	11	6	29	46
Washington.....	1	9	29	39	7	7	36	50
Shoustown, Etc.....	0	3	12	15	4	4	13	21
Total.....	41	38	97	176	53	37	109	199

GRAND SUMMARY.

Field.	APRIL 30, 1887.				MARCH 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Allegany.....	3	33	5	41	1	33	3	37
Bradford.....	8	27	16	51	8	30	12	50
Warren and Forest.....	27	21	40	88	18	22	39	79
Lower Country.....	41	38	97	176	53	37	109	199
Total.....	79	119	158	356	80	122	163	365
Total March 31.....	80	122	163	365				
Difference.....	1	3	5	9				

SUMMARY of the Statements of the National Transit Company for April and March:

	April.	March.
	Barrels.	Barrels.
Receipts from all sources.....	1,665,810.51	1,765,907.67
Deliveries.....	1,657,057.03	1,990,813.23
Gross stocks end of month.....	32,952,525.44	32,779,587.01
Sediment and surplus.....	3,803,145.35	3,630,528.75
Total liabilities end of month.....	29,149,380.09	29,149,058.26
Outstanding acceptances.....	22,428,036.33	22,472,039.08
Credit balances.....	6,721,343.76	6,677,019.18

The above "receipts from all sources" for April were made up as follows:

Runs from wells.....	1,345,877.49
Received from other lines.....	319,933.02
Total.....	1,665,810.51

The above "total deliveries" for April were made up as follows:

Regular shipments.....	1,601,351.25
Delivered to other lines.....	55,705.78
Total.....	1,657,057.03

The above "receipts from all sources" for March were made up as follows:

Runs from wells.....	1,376,756.07
Received from other lines.....	389,151.60
Received in iron tanks.....	
Total.....	1,765,907.67

The above "total deliveries" for March were made up as follows:

Regular shipments.....	1,932,299.54
Delivered to other lines.....	58,513.69
Total.....	1,990,813.23

THE Paducah Natural Gas Company, of Paducah, Ky., has been formed with a capital stock of \$50,000. John C. Farly, president; J. M. Bigger, vice-president; W. F. Paxton, secretary; John R. Puryear, treasurer.

THE Kansas City Natural Gas Company, of Kansas City, Mo., has been incorporated, with a capital of \$250,000. Mr. John W. Ryckman, of the Kansas City Commercial, is one of the principal incorporators.

The Lima Field in April.

Notwithstanding the fact that the crude petroleum of Northwestern Ohio has never commanded above fifty per cent. of the value of the Pennsylvania product, developments have been pushed forward with more than commendable zeal. The recent cut in the price from 30 to 27½ cents per barrel will hardly prove more than a temporary check to the activity of the drill, and is doubtless only an easy way of letting the price down to 25 cents or even still lower figures. The attempt to bring the product into general use as a fuel is being prosecuted with considerable energy and the quantity that is converted into refined oil is small. The demand for the oil is not large and the consumption has not as yet exceeded 3000 barrels a day. The best estimates of the daily production place it about 13,000 barrels showing a surplus of 10,000 barrels a day, which is purchased and stored up by the pipe companies for future use.

The area of undrilled territory that appears reasonably sure of good wells is large, and with an increased demand and better prices for the oil, the present production would be doubled very quickly. That there is very little incentive in the line of profit in drilling new wells with oil at 27½ cents is pretty freely admitted, but the man who strikes a 2000-barrel well is pretty sure to make some money, and possibilities of obtaining such strikes are the inducements for much of the drilling. It is a repetition on a smaller scale of the early days of the Bradford field, and the same story of increasing stocks and decreased value is being repeated in a more vigorous and rapid manner.

Fifty-four new wells were reported as completed in the Ohio field in April, and on the last day of the month there were 53 drilling wells and 47 rigs up and building. The total number of producing wells in the field on May 1st is estimated at 426.

The figures as reported by the pipe lines of the Lima field for the month of April are as follows:

RUNS OR RECEIPTS APRIL, 1887.	
Buckeye Pipe Line.....	352,798
Excelsior Pipe Line.....	8,580
Scotfield, Schurmer & Teagle.....	1,870
Findlay Pipe Line.....	1,420
Total.....	364,668
Daily average.....	14,155
SHIPMENTS OR DELIVERIES (APRIL.)	
Buckeye Pipe Line.....	77,900
Excelsior Pipe Line.....	1,540
Scotfield, Schurmer & Teagle.....	1,870
Findlay Pipe Line.....	1,420
Total.....	81,730
Daily average.....	2,724
STOCKS APRIL 30, 1887.	
Buckeye Pipe Line (iron tanks).....	1,429,664
At wells (wooden tanks) Lima.....	30,781
At wells (wooden tanks) Findlay.....	57,200
At wells (wooden tanks) North B. & M. more.....	2,200
Total.....	1,519,845
Increase during April.....	274,898

April Production Report.

Reports of the stocks on hand at 5300 Bradford wells showed an average decrease of two and a half barrels to the well during April.

The number of wells in the Bradford field connected with the pipe lines on the first of May is estimated at 14,060. Estimating the entire Bradford region on the basis of two and a half barrels decrease, the total decrease in stocks at wells during April was 35,150 barrels, a daily average of 1172 barrels. Subtracting the decrease in stocks from the total runs as reported by the National Transit and Tidewater pipe lines, Bradford's daily average production for April is as follows:

	Barrels.
Average Daily Pipe Line Runs.....	23,052
Average Daily decrease of Stocks at Wells.....	1,172
Bradford's April Production, estimated.....	21,880
March " " ".....	22,327
Average Daily Decrease.....	447

THE ALLEGANY FIELD.

Stocks reported from the Allegany field show an average decrease of 3.4 barrels to the well in April, which gives a daily average decrease of 453 barrels in stocks at wells. This amount subtracted from the average pipe line runs, places Allegany's daily average production for April at 4447 barrels. The estimated production for March was 4930 barrels, February 5049, for January 5563, for December 5178 and for November 5860 barrels a day.

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

Field.	No. Wells April 1.	No. Wells May 1.	Average per well April 1.	Average per well May 1.
Clarendon and Tiona.....	63	64	35	29
Cherry Grove.....	22	22	63	45
Cooper District.....	106	106	41	41
Lower Country.....	131	131	87	76
Miscellaneous.....	174	217	125	99

Accepting the outside runs, which are made up of the producing fields outside of Bradford and Allegany, as representing the production outside of those two fields, an estimate on the yield for April and March is as follows:

Field.	April. Barrels.	March. Barrels.
Bradford.....	21,880	22,327
Allegany.....	4,447	4,930
Outside Runs.....	37,120	36,135
Total.....	63,447	63,392
Macksburg.....	1,110	1,015
Total with Macksburg.....	64,557	64,407
Increase per diem.....	150	.....

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region. The runs from Washington are included with the outside field. The Lima runs by the Buckeye Pipe Lines were 11,760 barrels a day in April, 9777 barrels a day in March, 7394 barrels in February, 4226 barrels in January, 4374 barrels in December, 4038 barrels in November and 4112 barrels in October.

The following table shows the comparative production for 1884, 1885, 1886 and 1887:

	Bradford.		Allegany.		Outside Runs.		Total Prod.	
	1885.	1884.	1885.	1884.	1885.	1884.	1885.	1884.
January.....	28,675	31,806	8,260	11,264	18,594	16,140	55,529	59,240
February.....	27,051	32,378	7,196	11,607	19,800	18,561	54,047	62,546
March.....	26,444	31,912	7,342	11,768	19,923	19,764	53,709	63,444
April.....	27,413	32,442	7,169	11,848	23,067	19,162	57,649	63,452
May.....	27,231	33,922	7,049	11,547	21,225	19,549	55,505	65,018
June.....	29,272	33,753	7,463	11,108	21,559	19,977	58,294	64,838
July.....	30,309	34,031	7,139	11,218	19,273	20,870	56,721	66,119
August.....	29,558	33,353	7,065	10,384	18,608	22,830	55,531	65,567
September.....	30,205	32,976	7,186	9,877	21,269	22,514	58,660	65,367
October.....	30,180	31,758	6,747	9,356	23,161	22,762	60,088	63,876
November.....	31,355	31,789	7,002	8,642	23,087	23,557	61,444	63,988
December.....	29,223	29,516	6,196	8,193	24,184	22,918	59,603	60,297
1886.	1885.	1886.	1885.	1886.	1886.	1885.	1886.	1885.
January.....	28,677	28,675	6,378	8,260	22,217	18,594	57,272	55,529
February.....	28,586	27,051	6,651	7,196	22,603	19,800	57,840	54,047
March.....	27,947	26,444	6,137	7,342	25,680	19,923	59,764	53,709
April.....	27,807	27,413	6,527	7,169	28,693	23,067	63,027	57,649
May.....	27,148	27,231	6,535	7,049	34,515	21,225	68,198	55,505
June.....	27,860	29,272	6,551	7,463	40,040	21,559	74,454	58,294
July.....	27,046	30,309	6,350	7,139	40,491	19,273	73,887	56,721
August.....	26,695	29,558	6,200	7,065	43,762	22,830	76,657	55,531
September.....	26,674	30,205	5,994	7,186	45,560	21,269	78,228	58,660
October.....	25,454	30,180	6,017	6,747	45,538	23,161	77,009	60,088
November.....	24,503	31,355	5,860	7,002	40,817	23,087	71,180	61,444
December.....	22,422	29,223	5,178	6,196	38,783	24,184	66,383	59,603
1887.	1886.	1887.	1886.	1887.	1886.	1887.	1886.	1887.
January.....	23,269	28,677	5,563	6,378	34,254	22,217	63,086	57,272
February.....	22,930	28,586	5,049	6,651	35,745	22,603	63,724	57,840
March.....	22,327	27,947	4,930	6,137	36,135	25,680	63,392	59,764
April.....	21,880	27,807	4,447	6,137	37,120	28,693	63,447	63,027

At the annual meeting of the Columbia Natural Gas Company, held in Franklin, May 3d, the following officers were elected: President, James E. Salter; Vice-President, C. W. Mackey; Treasurer, B. W. Breden; Secretary, James Miller; Superintendent, W. T. Baum; Directors, James McManes, J. E. Salter, W. H. Berry, J. J. Martin, of Philadelphia; M. H. Stanton, I. N. Patterson, C. W. Mackey, of Franklin; Thomas Tanner, R. E. Townsend, of Pittsburgh.

The Philadelphia Company's Annual Report.

The report of the Philadelphia Company, of Pittsburgh, for the year 1886, is an instructive compendium of the workings and earnings of the largest natural gas corporation in the world. The officers for the coming year are as follows: President, George Westinghouse, Jr.; Vice-President and General Manager, Charles Paine; Secretary and General Agent, J. R. McGinley; Treasurer, John Caldwell; General Superintendent, T. A. Gillespie; Auditor, Allen Marthens; Directors, George Westinghouse, Jr., Charles Paine, Robert Pitcairn, John Dalzell, A. Groetzinger, John Caldwell, C. H. Jackson, H. H. Westinghouse, A. M. Byers.

The company controls at present 56,278 acres of prospective gas territory, much of which has been thoroughly and carefully explored and is known to be valuable. Its total mileage in pipes of all sizes, January 1st, was 411.87, distributed as follows:

Diameter.	Miles.
30 -inch	2.20
24 "	14.92
20 "	14.86
16 "	8.23
12 "	11.51
10 "	36.63
8 "	144.91
6 "	37.69
5½ "	77.42
4½ " .....	.77
4 "	38.39
3 "	8.02
2½ " .....	.09
2-inch and under	16.19

The wells owned by the company April 1st were as follows:

GAS WELLS.		No. wells.
District.		
Lyon's Run.....		13
Murrysville.....		42
Montour.....		1
Tarentum.....		5
Homewood.....		2
Apollo.....		1
OIL WELLS.		
Shoustown.....		3
Total.....		67

The total number of connections made by the Philadelphia Company with mills and dwellings for the year just closed is 12,400, an increase of 5400 over the preceding year.

The pipe lines, gas wells and plant of the company were increased during the year 1886, by an expenditure for construction amounting to \$1,198,657.28.

The earnings for the year 1886 were \$1,500,160.78. The operating expenses for the year amounted to \$355,899.96, equal to 23.72 per cent. of the earnings. Interest and taxes have amounted to \$186,276.03, or 12.42 per cent. of the earnings. Dividends, at the rate of 1 per cent. per month, amounting to \$621,536.36, have been paid, equal to 41.43 per cent. of the earnings, leaving surplus earnings for the year 1886, amounting to \$336,448.43, equal to 5.57 per cent. upon the capital of December 31, 1886, not divided.

The earnings for the three months ending March 31, 1887, amounted to \$464,311.28; the surplus after paying all expenses and dividends was \$135,770.46. On that day the sum of undivided profits amounted to \$857,411.59.

On the 31st of March, 1887, the debt of the company had been reduced from what it was on January 1, 1886, by \$724,358.75, leaving as the present net debt of the company \$1,052,404.31.

Upon the 1st of May, 1887, this company assumed the operation of the lines and property of the Pennsylvania Natural Gas Company, under a contract extending over a period of twenty years; according to which this company is to pay to the Pennsylvania Company 6 per cent. upon its capital stock of one million dollars during the first eight years; and thereafter, during the next twelve years, one-half the rate upon its capital stock that is paid upon the capital stock of the Philadelphia Com-

pany. This arrangement is believed to be a judicious one. It may be desirable to reinforce this company's supply of gas at the western end of its pipes, to extend its system westward into new territory, and to lessen the average distance over which the volume of gas which it distributes is to be carried; a consideration which will become of greater importance with the lapse of time. It adds to the resources of the Philadelphia Company the control of about 12,000 acres of fertile territory in the Washington fields, where the company previously held a large area of territory, yet had no pipe line; but it does not in any way require the Philadelphia Company to furnish gas from its own lines or territory to increase the supply upon the Pennsylvania Gas Company's system.

The National Oil Company's Refinery.

The National Oil Company, of Titusville, commenced the business of oil refining on the 9th of May. Its progress will be carefully watched, and its success will stimulate activity in the same direction at other points in the oil regions. It is the first organization on a large scale to produce, pipe and refine petroleum. Composed of veteran and conservative oil men of wide experience and abundant means, it starts with the best wishes of all who have the interests of the oil country at heart.

The company consists of John Fertig, J. A. Cadwallader, W. C. Warner, S. S. Henne and Roger Sherman. Mr. Cadwallader is president, Mr. Fertig treasurer, and Mr. Warner secretary. Captain John S. Hunter is in charge of the refinery, while Mr. Henne attends to producing and piping the oil.

The works occupy twelve and one-half acres of ground and their present capacity is 14,000 barrels of crude oil per month, which can be increased, with a little additional expense, to 25,000 barrels. The company owns a two-inch pipe line, nine and one-half miles in length, which runs the oil from the company's wells, at Grand Valley, to the iron tanks at the refinery. These tanks are two in number, one of 26,000 and the other of 3500 barrels capacity. The company at present owns seventy producing wells in the Grand Valley field, and has the territory for thirty more. These wells will furnish all the crude needed at this stage of the enterprise. The company is now in a position to produce, transport and manufacture the crude product into the refined article and deliver it direct to the consumer.

The Zoar Mystery.

Cattaraugus creek rises in Java township, Wyoming county, flows in a westerly direction and empties into Lake Erie. This creek forms the boundary line between Erie and Cattaraugus counties. Along the north side of the creek and near the boundary line between Collins and Concord townships of Erie county the Zoar mystery is located. This point is about midway between the Buffalo, Rochester & Pittsburg and Buffalo & Southwestern railroads. It is situated in a narrow defile of the creek and along the southern part of the White farm. The well was drilled by the Ohio Valley Oil and Gas Company, of which John M. Patterson, of Pittsburgh, is the chief officer. At a depth somewhere between 1100 and 1700 feet the drill was vibrating when a puff of gas came up and the well was shut down. One farmer with a lively imagination reports that oil was struck. But there is a premium on the photograph of the oilman who has seen any oil from the well. Up to this date shrewd operators and sleek land scalpers, the keenest in the business, are tying up and leasing all the land that can be obtained for miles around the well. The newspapers have been freighted with misrepresentations in regard to the amount of money which has been paid for leases. An AGE representative who passed a day at Zoar found that only \$250 in cash had been paid where over \$40,000 was currently reported and advertised to have been given for property. It is a question if the contractor who has leased land and the owners of the well can determine just what further drilling will disclose at this venture on Cattaraugus creek. At the least calculation the well is 300 to 400 feet below the level of the Bradford sand in that locality.

THE PETROLEUM AGE.

ACME OIL COMPANY,

→ **REFINERS OF PETROLEUM** ←

MANUFACTURERS OF THE

CROWN ACME OIL

Prepared with Great Care for Family Use.

ABSOLUTELY SAFE,

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Best Illuminator in the World.

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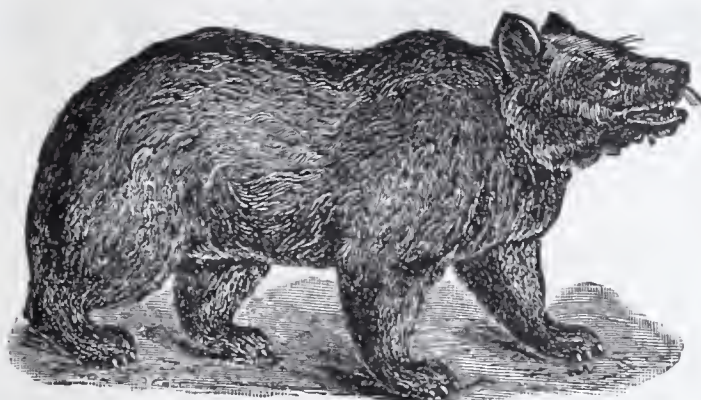
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BEAR CREEK REFINING CO., (LIMITED.)

REFINERS

OF THE BEST
Illuminating Oils
MADE.



BRANDS :

URSOLEUM—Strictly water white, 48° gravity, or better, fire test, 150°.

RAILROAD.—Water white, 47° gravity, fire test, 150°.

BEAR CREEK — Standard white, 46° gravity, fire test, 110°.

Gasolines and Deodorized Benzines of excellent quality and all gravities.

REFINERY, COLEMAN STATION, A. V. R. R. OFFICE, COR. 11TH & ETNA STS., PITTSBURG, PA.

JOHN COCHRAN,

MANUFACTURER OF J. M. DAVIDSON'S

PATENT REVERSE TWIST STEEL SUCKER RODS.

We would call the attention of Producers to the fact that these Rods have been improved by upsetting the end before welding, giving about double the stock in the weld.

The advantages of these Rods over wooden are

No Rivets, No Warping, No Waiting for Rods to Settle Through Paraffine.

A special advantage is where wells are pumped with sucker rod motion. The new rods are giving the best of satisfaction to parties using them.

Rods made for 1 1/4 inch and 2 inch Tubing.

Factory! Chestnut Street, Near B., B. & K. Freight Depot,
LOCK BOX 1543, BRADFORD, PA.

THE STANDARD PRESSURE REGULATOR.

Designed Especially for Natural Gas.

Patented Nov. 10, 1885.

We deliver 2 to 20 oz. from 25, 50 or 100lb. High Pressure Main.

We can furnish these valves with flanges suitable for connection to 3, 4 or 6-in. supply.

They are guaranteed to deliver an even flow from a variable supply; to work without pulsating.

House Valves—No. 1, 1x2 inches; No. 2, 1 1/4x2 1/2 in.

[6-IN. MILL OR STREET MACHINE.]

For full particulars, terms, etc., address.

Patented Jan. 26, 1886.

Attention is directed to our method of freeing Natural Gas from dirt or other foreign matter before passing seats of valves. The Plug shown at bottom of cut opens into inlet passage, and through this opening any dirt may be removed.

This feature will be appreciated by those using from recently completed lines.

We have two sizes, Nos. 6 and 7. Where a variation of 1-2 oz. is permissible we recommend No. 6; where it is necessary to govern with less variation, No. 7.

E. C. MERRILL & CO.,

5919 Broad Street, Pittsburgh, Pa.

W. H. DUFUR, Chairman.

JAS. B. BERRY, Secretary and Treasurer.

THE ASTRAL REFINING CO.,
LIMITED.

Refiners and Producers of Petroleum,

ALL QUALITIES OF

Illuminating, Lubricating Oils, Naphthas and Gasoline,
OIL CITY, PENN'A.

Manufacturers of "Water White Astral Oil," 48 to 49 Gravity, 50 Fire Test.

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Buys, Sells and Leases all kinds of Oil Properties. In-
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ATTORNEY AT LAW,

Solicitor of Patents and Attorney in Patent Causes.

ROOM NO. 3,

Over Oil Well Supply Company, Limited.

Corner Main and Webster streets, - - BRADFORD PA.

FOR OIL OR GAS WELL PACKERS

SEND YOUR ORDERS TO

S. R. DRESSER, BRADFORD, PA.,

Who will fill them promptly with

The Best Malleable Iron Frame and Superior Quality of Rubber.

He Makes a Specialty of the Packer Business and Can Give You

Anything in that Line.

H. A. MARLIN & CO.,

PETROLEUM BROKERS

BRADFORD AND NEW YORK.

SHENANGO & ALLEGHENY R. R.

TAKES EFFECT MONDAY, OCT. 11, 1886.

Trains are run by Standard Central Time (90th Meridian.)

NORTHWARD.			STATIONS.	SOUTHWARD.		
6	4	2		1	3	5
P. M.	P. M.	A. M.		A. M.	A. M.	P. M.
8 05	2 25	10 40	Ar.....Greenville.....Dp	6 07	11 10	3 20
7 55	2 15	10 30	.....Shenango.....	6 17	11 20	3 33
7 41	1 59	10 17	.....Kremis.....	6 29	11 31	3 44
7 31	1 47	10 08	.....Fredonia.....	6 37	11 40	3 52
7 24	1 40	10 02	.....Coolspring.....	6 42	11 45	3 56
7 23	1 38	10 01	.....Kerby Siding.....	6 43	11 46	3 57
7 12	1 26	9 50	.....Mercer.....	6 57	11 58	4 08
7 02	1 15	9 40	.....Pardee.....	7 07	12 08	4 17
6 57	1 07	9 36	.....Filer.....	7 11	12 12	4 22
6 49	1 00	9 29	.....Grove City.....	7 19	12 22	4 28
6 46	12 55	9 26	.....Reed.....	7 20	12 24	4 30
6 35	12 40	9 16	.....Harrisville.....	7 33	12 40	4 41
6 30	12 34	9 12	.....Wick.....	7 37	12 45	4 45
6 25	12 29	9 07	.....Branchton.....	7 42	12 50	4 50
6 22	12 25	9 05	.....Coaltown Junction.....	7 44	12 52	4 52
6 19	12 22	9 03	.....Keisters.....	7 47	12 55	4 55
6 11	12 14	8 56	.....Hallston.....	7 56	1 03	5 02
6 02	12 04	8 46	.....Euclid.....	8 07	1 13	5 11
5 53	11 54	8 37	.....Jamisonville.....	8 17	1 22	5 19
5 45	11 45	8 30	.....Oneida.....	8 30	1 31	5 25
5 35	11 35	8 20	.....P. & W. Junction.....	8 40	1 42	5 35
5 25	11 30	8 15	Dp.....Butler.....Ar	8 43	1 45	5 37
			Pittsburgh & Western R. R.			
3 30	9 20	6 00	.....Allegheny.....	10 30	3 58	7 35
P. M.	A. M.	A. M.		A. M.	P. M.	P. M.

HILLIARD BRANCH.

10	12	STATIONS.	9	11
A. M.	A. M.		A. M.	P. M.
12 00	7 30	Ar.....Branchton.....Dp	9 10	6 30
11 50	7 20	.....Bovard.....	9 20	6 35
11 30	6 56	.....Annandale.....	9 40	7 00
11 20	6 48	.....Roy.....	9 50	7 10
11 00	6 40	Dp.....Hilliard.....Ar	10 00	7 20
A. M.	A. M.		A. M.	P. M.

Trains 4 and 5 run daily with through coach service between Allegheny, Chautauqua Lake and Jamestown, N. Y. All other trains daily except Sunday.

I. D. STINSON, G. P. A.,

Greenville, Pa.

J. T. BLAIR, Gen. Man.,

Greenville, Pa.

Philadelphia & Erie Railroad.

Time Table in Effect Nov. 15, 1886. | Eastern Standard Time.

EASTWARD.		Kane Express No. 18.	Day Express No. 8.	Erie Mail No. 4	Kane Accom. No. 12.
Erie	Lv.	7 35 a m		2 45 p m	5 25 p m
Corry	"	9 00 "		4 13 "	7 00 "
Irvinton	"	9 52 "		5 00 "	7 50 "
Warren	"	10 08 "		5 15 "	8 05 "
Kane	Ar.	11 25 "		6 30 "	9 15 "
Kane	Lv.		6 25 a m	6 55 "	
Johnsonburg	"		6 58 "	7 30 "	
Emporium Junction	"		8 30 "	9 15 "	
Lock Haven	"		11 15 "	11 58 "	
Williamsport	"		12 25 p m	1 25 a m	
Harrisburg	Ar.		3 25 "	4 30 "	
Philadelphia			6 50 "	8 25 "	
WESTWARD.		Erie Accom. No. 11.	Erie Mail No. 3.	Niagara Express No. 11.	Erie Express No. 17.
Philadelphia	Lv.		11 25 p m	7 40 a m	
Harrisburg	"		3 30 a m	11 25 "	
Williamsport	"		7 10 "	2 25 p m	
Lock Haven	"		7 58 "	3 15 "	
Emporium Junction	"		10 30 "	6 25 "	
Johnsonburg	"		12 00 m	8 02 "	
Kane	Ar.		12 40 p m	8 35 "	
Kane	Lv.	6 35 a m	1 00 "		4 16 p m
Warren	"	7 45 "	1 58 "		5 25 "
Irvinton	"	7 58 "	2 09 "		5 48 "
Corry	"	8 55 "	2 56 "		6 50 "
Erie	Ar.	10 15 "	4 00 "		8 10 "

Trains daily except Sunday.

THROUGH-CAR ARRANGEMENT WESTWARD—Erie Mail—Pullman Palace Sleeping Cars Philadelphia to Erie, and Philadelphia to Williamsport (cars open to receive passengers at Philadelphia at 10 00 p m), and Washington to Williamsport. Passenger Coaches from Philadelphia to Erie, and Baltimore to Williamsport.

Niagara Express—Pullman Parlor Car Philadelphia to Williamsport.

THROUGH-CAR ARRANGEMENT EASTWARD—Day Express—Pullman Parlor Car Williamsport to Philadelphia. Passenger Coaches Kane to Philadelphia, and from Williamsport to Baltimore.

Erie Mail—Pullman Sleeper Erie to Philadelphia, and Williamsport to Philadelphia. (Car open to receive passengers at Williamsport at 9 00 p m.) Passenger Coaches Erie to Philadelphia, and Williamsport to Baltimore. Sleeping Car Williamsport to Washington.

W. & W. R. R. TIME TABLE.

DECEMBER 27, 1886.

NORTHWARD		STATIONS.	SOUTHWARD	
No. 3	No. 1		No. 2	No. 4
P. M.	A. M.		A. M.	P. M.
2 00	6 00	Lv. Wayneburg	Ar.	10 35
2 15	6 15	Sycamore		10 17
2 23	6 23	Swart		10 09
2 30	6 30	Deer Lick		10 02
2 38	6 38	West Union		9 53
2 47	6 47	Dunn		9 43
2 50	6 50	Lindley's Mills		9 40
3 01	7 02	West Amity		9 28
3 06	7 08	Luellen		9 22
3 11	7 13	Baker		9 17
3 14	7 20	McCracken		9 13
3 27	7 35	Vankirk		9 00
3 40	7 50	Braddock		8 48
3 55	8 05	Ar. Washington	Lv.	8 35
6 36	9 55	Ar. Pittsburgh	Lv.	6 10
P. C. & St. L. R. R.				

Time given above is Central Standard, which is 40 minutes slower than Pittsburg or local time, or one hour slower than Eastern time.

The Company reserve the right to vary from this schedule as circumstances may require. All trains daily except Sunday.

C. E. BOWER, Superintendent.

JOHN F. STRATTON,

49 Maiden Lane,

New York.



Importer, Manufacturer and Wholesale Dealer in all kinds of Musical Merchandise, Musical Boxes, Band Instruments. Stratton's Celebrated Russian Gut Violin Strings.



FRANK B. CONVERSE

BANJO.

The PITTSBURG & WESTERN RAILROAD Time Table

NORTHERN DIVISION.

SOUTHBOUND TRAINS.

STATIONS.		27		17
		P. M.	A. M.	A. M.
Bradford	Lv.			6 00
Mt. Jewett	Lv.			7 40
Kane				10 10
Sheffield Junction				11 04
Marienville				11 47
Tylersburg				12 27
Clarion Junction		6 20	1 14	4 00
Clarion		6 50	12 35	3 30
Shippenville	23	6 30	1 28	4 14
Knox		6 45	1 45	4 33
St. Petersburg	A. M.	7 24	2 30	5 20
Foxburg	5 40	7 38	3 00	5 40
Parker	5 50	7 48	3 10	
Bruin	6 08	8 06	3 31	P. M.
Petrolia	6 18	8 17	3 45	
Karns	6 22	8 22	3 50	9
Millerstown	6 36	8 36	4 07	
St. Joe	6 50	8 50	4 25	P. M.
Butler	7 18	5 15	9 30	5 25
Renfrew	7 39	5 28	9 46	5 45
Callery Junction	8 05	5 50	10 10	6 05
Allegheny	9 30	7 10	11 20	7 20
	A. M.	A. M.	P. M.	P. M.

NORTHBOUND TRAINS

STATIONS.		28	8	18	24	26
		A. M.	A. M.	A. M.	P. M.	P. M.
Allegheny	Lv.	3 15	9 20	7 20	12 40	5 35
Callery Junction		4 40	10 40	8 35	1 50	6 50
Renfrew		5 02	11 00	8 55	2 13	7 12
Butler		5 20	11 20	9 18	2 36	7 30
St. Joe				9 45	3 08	8 00
Millerstown				10 30	3 23	8 14
Karns				10 15	3 38	8 28
Petrolia			20	10 20	3 45	8 32
Bruin				10 32	3 56	8 43
Parker				10 52	4 15	9 00
Foxburg			6 25	11 25	4 40	9 10
St. Petersburg			6 44	11 41	4 54	
Knox			7 49	12 32	5 40	
Shippenville			8 11	12 53	5 58	
Clarion Junction			8 30	1 14	6 10	
Clarion			9 00	1 45	6 40	
Tylersburg				1 48		
Marienville				2 26		
Sheffield Junction				3 06		
Kane	Ar.			3 58		
				4 40		
Bradford	Ar.			6 35		
		A. M.		P. M.	P. M.	P. M.

Westbound trains leave Callery Junction as follows:

Cleveland and Toledo Express 8.35 a. m., New Castle Accommodation 4.43 p. m., Chicago Express, with through Sleeping Car, 1.44 p. m., Zelenople Accommodation 6.55 p. m.

No. 17 makes direct connection at Allegheny with B. & O. R. for Washington and Baltimore.

No. 19 connects at Foxburg with A. V. R. R. for Franklin and Oil City.

SUNDAY TRAINS Nos. 23 and 26 will run daily. Nos. 18 and 17 will run daily between Butler and Allegheny. No. 23 connects at Callery Junction for Allegheny and New Castle. No. 26 gets connections from Allegheny and New Castle. All other trains run daily, except Sunday.

THOS. M. KING, General Manager.

C. W. BASSETT, General Passenger Agent.

DUNKIRK, ALLEGHENY VALLEY & PITTSBURGH R.R.

Going North.		Express No. 2.	Mail No. 4.	Sunday No. 6.
Titusville, leave		7 35a.m.	3 20p.m.	7 35a.m.
Grand Valley		8 03a.m.	3 48p.m.	8 01a.m.
Irvinton		8 45a.m.	4 36p.m.	8 44a.m.
Warren		8 58a.m.	4 53p.m.	8 56a.m.
Junction		9 55a.m.	5 45p.m.	9 48a.m.
Lily Dale		10 50a.m.	6 36p.m.	10 37a.m.
Dunkirk, arrive		11 25a.m.	7 10p.m.	11 12a.m.
Going South.		Mail No. 1.	Express No. 3.	Sunday No. 5.
Dunkirk, leave		9 25a.m.	4 00p.m.	2 40p.m.
Lily Dale		10 03a.m.	4 38p.m.	3 14p.m.
Junction		11 02a.m.	5 45p.m.	4 08p.m.
Warren		11 55a.m.	6 44p.m.	5 06p.m.
Irvinton		12 10a.m.	7 00p.m.	5 22p.m.
Grand Valley		12 58p.m.	7 49p.m.	6 12p.m.
Titusville, Ar		1 20p.m.	8 15p.m.	6 40p.m.

THE PETROLEUM AGE.

Buffalo, New York & Philadelphia R. R. THE NEW SHORT LINE TO SUNBURY, WILLIAMSPORT, HARRISBURG PHILADELPHIA, BALTIMORE, WASHINGTON, AND ALL POINTS SOUTH.

Leave Buffalo at 8:00 a. m. (except Sunday) arriving at Olean at 11:00 a. m. Connects at Olean for Bradford. Arriving at 12:45. Train leaves Buffalo at 3:00 p. m. (except Sunday) arriving at Olean at 6:00 p. m., connecting at Olean for Bradford; at Port Allegany for Coudersport; at Emporium with P. & E. R. R. for Harrisburg, Philadelphia, Baltimore, Washington and the South. Train leaves Buffalo at 5:20 p. m. (daily) arrives at Olean at 8:20 p. m.

Train for Buffalo leaves Olean at 5:45 (daily) and 10:45 a. m. (except Sunday) arriving at Buffalo at 8:40 a. m. and 1:25 p. m. Afternoon train leaves Olean at 4:00 (except Sunday) arrives at Buffalo at 7:00 p. m.

GEO. S. GATCHELL, J. A. FELLOWS,
Gen'l. Superintendent. Gen'l. Pass and Ticket Agent.
NARROW GAUGE DIVISION, BRADFORD & OLEAN.

EASTWARD.				WESTWARD.			
Sun.	Exp.	Mail	Exp.	Eastern Time.	Exp.	Mail	Exp.
A. M.	P. M.	P. M.	A. M.		A. M.	A. M.	P. M.
7 37	8 30			Ar. Richburg Lv	9 00	2 32	
7 30				" Bolivar "	5 45	9 10	2 40
11 00	6 00	3 55	8 58	" Olean "	7 20	11 00	6 05
9 15	4 15	2 15	7 15	Lv. Bradford Ar	9 00	12 45	7 50
A. M.	P. M.	P. M.	A. M.		A. M.	P. M.	P. M.

BETWEEN ELDRED AND BRADFORD.

Exp.	Exp.	Exp.	Eastern Time.		Exp.	Exp.	Exp.
P. M.	P. M.	A. M.			A. M.	A. M.	P. M.
5 10	2 55	8 30	Ar.	Eldred	Lv.	7 10	11 37
4 50	2 29	8 12	"	Duke Centre	"	7 28	11 53
3 55	1 16	7 15	"	Tarport	"	8 25	12 50
3 50	1 10	7 10	Lv.	Bradford	Ar.	8 30	12 55
P. M.	P. M.	A. M.			A. M.	P. M.	P. M.

30 Miles Saved by the New BRADFORD SHORT LINE,

Between Olean, Bradford, Warren and the Lower Oil Fields. Two fast Express Trains each way, daily except Sunday.

CONDENSED SCHEDULE OF THROUGH TRAINS.

EASTWARD.				WESTWARD.			
Exp.	Acc.	Exp.	Eastern Time.	Acc.	Exp.	Exp.	
P. M.	P. M.	A. M.		A. M.	A. M.	P. M.	
8 00	3 25	11 25	Ar. Bradford	Lv.	7 00	9 15	4 20
6 20	12 45	9 40	Lv. Kinzua	Ar.	9 15	11 00	6 00
P. M.	P. M.	A. M.		A. M.	A. M.	P. M.	
5 30		9 05	Lv. Warren	Ar.	11 50	6 49	
5 15		8 50	" Irvineton	"	12 05	7 05	
4 25		8 10	" Tidionton	"	12 43	7 43	
3 05		6 50	" Oil City	"	2 05	9 15	
9 00		8 50	Lv. Pittsburgh	Ar.	7 25	7 25	
A. M.		P. M.			P. M.	A. M.	

J. A. FELLOWS, Gen. Pass. and Ticket Agent,
Buffalo, N. Y.

Buffalo, Rochester & Pittsburgh R. R. BUFFALO AND ROCHESTER DIVISION.

Eastern Time.				STATIONS.			
P. M.	A. M.	P. M.	A. M.		A. M.	P. M.	A. M.
7 30	6 15	11 00		Ar. Buffalo	Lv.	8 40	5 00
3 18				" Rochester	"	7 50	
2 40	2 40	8 00		Lv. Salamanca	Ar.	12 30	12 30
5 00				Lv. Bradford	Ar.	12 30	
	2 15			Ar. do	Lv.	12 55	
	11 40			" Ridgway	"	3 26	
		9 56		" Falls Creek	"	4 55	
		9 50		" Dubois	"	5 02	
		8 40		Lv. Punxsutawney	Ar.	6 08	
A. M.							

Thousand Mile Tickets sold at Two Cents per mile.

Connections made at Salamanca with the N. Y., P. & O. R. R. for all points West and Southwest; also with the Erie R. R. for all Eastern points; at Bradford with the Narrow Gauge system to all points in the Oil Regions.

JAS. T. GARDNER, Sup't. I. S. EMERY, Gen. Pass. Agt.

Warren and Farnsworth Valley Railroad.

Narrow Gauge Railroad to Garfield, Vandergrift and Dunham's Mills.

Clarendon, Lv. 10 35 5 10 Garfield, Lv. 7 20 3 15
Garfield, Ar. 11 35 6 10 Clarendon, Ar. 8 20 4 15
Trains are run on P. & E. R. R. time. Passengers can leave Oil City and Titusville for Garfield by morning train, remain three and one-half hours in Garfield and return same evening.

A. D. WOOD, General Manager.

THE ERIE NARROW GAUGE SYSTEM.

BRADFORD, BORDELL & KINZUA

AND

Bradford, Eldred & Cuba Railroad.

November 25, 1886.

WESTWARD.			STATIONS.		EASTWARD.		
Exp.	Exp.	Mail.			Exp.	Mail.	Exp.
A. M.	P. M.	A. M.			A. M.	P. M.	A. M.
9 25	5 15	11 15	Ar. Bradford	Lv.	7 40	3 10	7 00
8 50	4 40	10 40	" Kinzua Junction	"	8 20	3 50	7 40
8 43			" Aiken	"			7 47
8 29			" Simpson	"			8 01
7 40			Lv. Smethport	Ar.			8 45
	4 32	10 30	" Rew City	"	8 28	3 56	
	4 12	10 05	" Rixford	"	8 46	4 12	
	4 07	10 00	" Duke Centre	"	8 51	4 17	
	3 48	9 40	" Eldred	"	9 10	4 35	
	3 32	9 25	" Bullis Mills	"	9 25	4 50	
	3 17	9 09	" Ceres	"	9 41	5 06	
	3 04	8 55	" Little Genesee	"	9 55	5 20	
	2 55	8 45	" Bolivar	"	10 05	5 30	
	2 34	8 21	" Allenstown	"	10 29	5 54	
	2 05	7 50	" Wellsville	"	11 00	6 25	
			" Kane	"			
A. M.	P. M.	A. M.			A. M.	P. M.	A. M.

Trains for Kane leave Bradford at 7.00 and 10.00 a. m. and 5.00, arriving at Kane at 9.30 a. m. and at 12.30 and 7.40 p. m. Trains leave Kane at 6.50 and 9.55 a. m., arriving at Bradford at 9.25 a. m. and 5.00 p. m.; arriving at Bradford at 2.45 p. m. and 5.10 p. m. arriving at Bradford at 7.55.

Additional trains leave Bradford for Smethport at 10.00 a. m. and 5.10 p. m. Returning, leave Smethport at 1.00 and 5.50 p. m.

JOHN C. McKENNA, Superintendent.

WHEELING AND LAKE ERIE

And Cleveland and Marietta R. R.'s.

Time Table—In effect Nov. 1, 1886.

Central Standard Time.

EASTWARD.		No. 5.	No. 7.	No. 9*	No. 1*
Toledo	Lv.	7 45a. m.	12 30p. m.	4 45p. m.	
Oak Harbor	Ar.	8 43	1 22	5 38	
Fremont		9 07	1 47	6 02	
Clyde		9 23	2 03	6 18	
Bellevue		9 38	2 18	6 32	
Monroeville	Lv.	9 57	2 32	7 01	1 35a. m.
Norwalk		10 13	2 50	7 20	1 50
Wellington		11 03	3 45	9 00	2 32
Creston	Ar.	11 52	4 33	10 45	3 15
Orrville	Ar.	12 20p. m.	5 05	11 45p. m.	3 45*
Orrville	Lv.	12 40	5 05	6 00a. m.	6 00
Massillon	Ar.	1 21	5 45	6 40	6 40
Massillon	Lv.	1 20	5 45	6 40	6 40
Bowerston	Ar.	2 55p. m.	7 35p. m.	9 40a. m.	9 40a. m.

Canal Dover		2 34p. m.	7 02p. m.	11 30a. m.	11 30a. m.
Newcomertown		3 13	7 46	12 09p. m.	12 09p. m.
Cambridge		4 08	8 37	1 02	1 02
Macksburg		5 39		2 30	2 30
Marietta	Ar.	6 55p. m.		3 38	3 38

WESTWARD.		No. 6.	No. 8.	No. 4.	No. 2*
Marietta	Lv.	7 00a. m.	11 00p. m.		
Macksburg		8 18	12 05		
Cambridge		9 52	1 27	5 30a. m.	
Newcomertown		10 47	2 20	6 20	
Canal Dover		11 30a. m.	2 54p. m.	6 55	
Bowerston		11 55a. m.	3 30p. m.	6 30a. m.	
Massillon		1 20p. m.	7 10	8 15	
Orrville	Ar.	1 55	8 20	8 55	
Orrville	Lv.	2 00	10 15*	8 55	
Creston	Lv.	2 30	10 45	9 25	
Wellington		3 18	11 28	10 12	
Norwalk		4 10	12 10	11 25	7 25a. m.
Monroeville		4 22	12 25a. m.	11 37	7 37
Bellevue		4 40	*	11 55	7 53
Clyde		4 56		12 10p. m.	8 08
Fremont		5 13		12 30	8 25
Oak Harbor		5 41		12 55	8 48
Toledo	Ar.	6 35p. m.		1 55p. m.	9 45a. m.

No. 29.	No. 27.	NORWALK & HURON.		No. 26.	No. 28.
5 15p. m.	11 40a. m.	Ar.	Huron	Lv.	6 25a. m.
4 30p. m.	10 45a. m.	Lv.	Norwalk	Ar.	7 15a. m.
					3 00p. m.

* Daily.

This road is now open through from Toledo to Bowerston, connecting with the Pennsylvania System for all points East.

THROUGH CAR SERVICE—Between Toledo, Cambridge and Marietta; Toledo and Bowerston; Toledo and Akron, Youngstown and Pittsburgh; Chicago, Akron, Youngstown and Pittsburgh.

M. D. WOODFORD,
General Manager.

JAMES M. HALL,
Gen'l. Pass. Agent

THE PETROLEUM AGE.

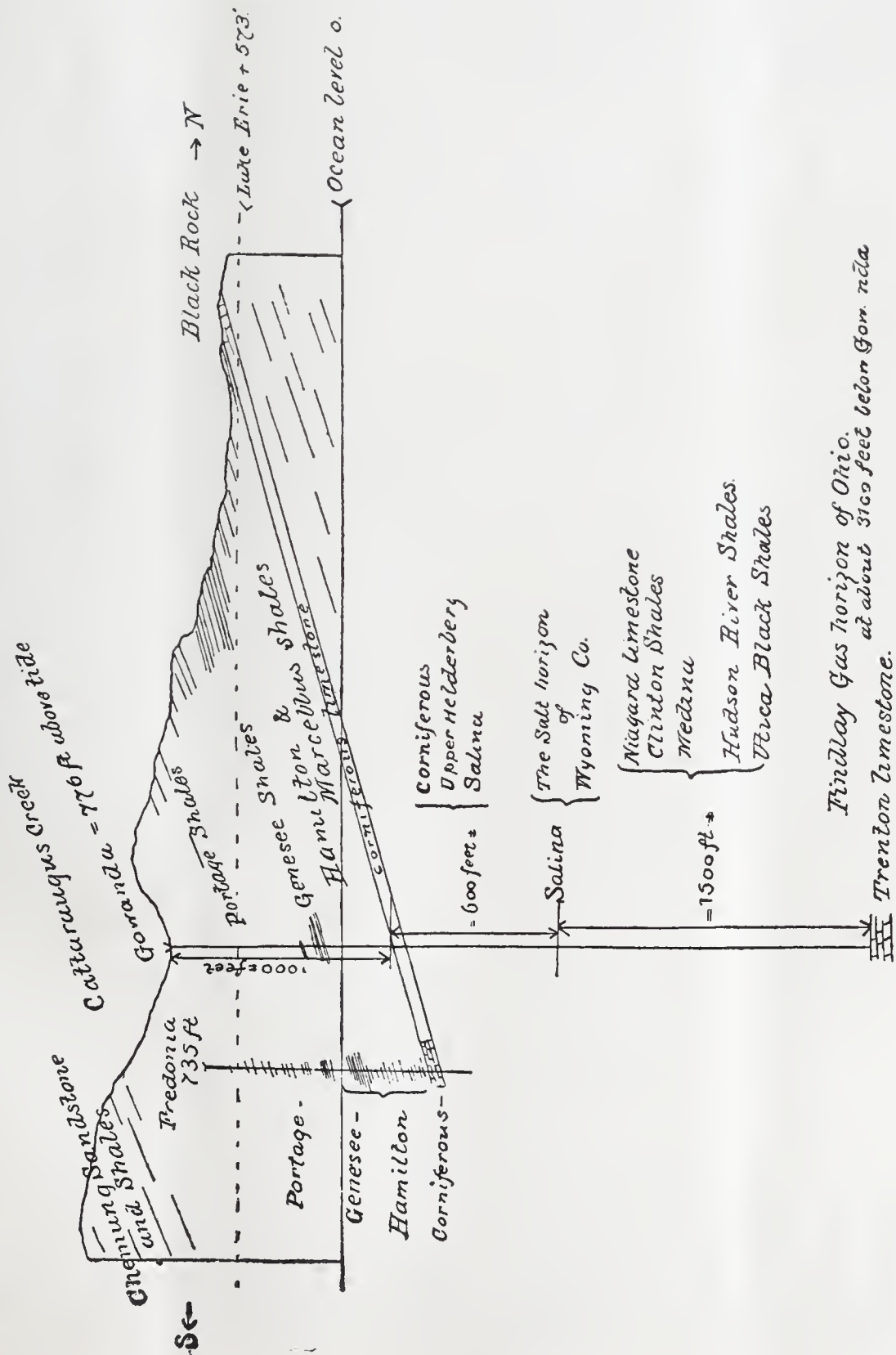
VOL. VI.

BRADFORD, PA., JUNE, 1887.

No. 5.

Generalized Profile and Sections of Erie and Cattaraugus Counties.

BY H. S. WILLIAMS.



Altitude above sea of Gowanda, 776 feet.

Approximate depth of Corniferous limestone below surface at Gowanda.

Approximate depth of Corniferous limestone below surface at Gowanda.....	1000 feet
Approximate distance from the Corniferous to the salt horizon.....	600 feet

Approximate distance from the salt horizon to the Trenton limestone.....	1500 feet
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Approximate depth of Trenton not less than..... 3100 feet

GEOLOGY OF SOUTHWESTERN NEW YORK.

BY H. S. WILLIAMS, MAY, 1887.

THE surface geology of this region was described thirty-five years ago in the Reports of the Geology of New York. Since then additional information has been furnished in regard to the underlying rocks, by the Canadian Reports on their outcrops further north, and by the well records, such as those of Fredonia and the Wyoming salt wells and others in Cattaraugus county and in Pennsylvania. J. F. Carrll, in the Report III, of the Second Geological Survey of Pennsylvania has given a generalized section from Black Rock, N. Y., to Dunkard creek, Greene county, Pa., and the present writer has added some facts from his own observation, in a paper before the American Association of Science, 1885, on the Classification of the Rocks of the Upper Devonian.

The surface features across this part of the State are simple. From the low, level country about Buffalo there is a gradual rise into hills as we reach the southern part of Erie county, increasing thence in height and roughness of surface to the southern limits of the State, some of the higher hills reaching 2000 feet or more above the sea. Going from north to south (see the section) there is a slight dip of the rocks amounting to an average of 25 feet to the mile in a direction 30° or 40° west of south—bringing successively into outcrop (1st.) a strip of the *Corniferous limestone*, extending from Black Rock eastward; (2d.) across the middle of Erie county, a strip of *Hamilton*, and (3d.) in the southern parts of Erie county and the northern edge of Cattaraugus the *Portage group*, while the main part of Cattaraugus is covered with (4th.) *Chemung rock*, with occasional outcrops of the higher conglomerates and sandstones capping the highest hills.

From the record of the Fredonia wells we learn that the *Corniferous limestone* is, at that point, about 315 feet below the level of the ocean, or at Gowanda, which is 776 feet above, and allowing for dip, it is not far from 1000 feet below the surface. Of this 1000 feet about 700 feet is *Portage* and *Genesee shales*, and the 300 feet below are *Hamilton* and *Marcellus*. From a comparison of the outcrops in the northern part of the State, and in Canada West, and from the records of the Wyoming county wells, we should estimate the *Helderberg* and *Salina* formations to be 450 to 500 feet thick, and with the thickness of the *Corniferous* group, 600 feet in all. Hence the salt horizon of Wyoming county should be struck at about 1600 feet below Gowanda. From study of the thickness of the lower rocks as they outcrop in Niagara river and in Canada West, and compared with the Ohio sections, the *Niagara*, *Clinton*, *Medina*, *Hudson river* and *Utica rocks* must occupy not less than 1500 feet.

From these estimates it is clear that the *Trenton limestone* will not be struck short of about 3100 feet below Gowanda.

The character of the rocks, as far as known, would indicate that more or less gas would be found for the first seven or eight hundred feet down. This is the place in the series for the Devonian black shales, and as far eastward and northward as Livingston and Genesee counties whenever they come to the surface the shales are strongly permeated with petroleum odor. But above the black shales the first coarse sandstones in the above named counties, and in Wyoming county, are always

strongly scented with petroleum when freshly taken from the quarry.

Also there are frequent gas springs, dotted all over the southwestern part of the State, and occasionally oil springs, the source of both the gas and oil of which is doubtless these black shales.

But the gas, as shown by the Fredonia wells, and those of Wyoming county, is not high pressure gas, nor is it found in reservoirs of any great capacity, but is rather a slow distillation from the shales themselves escaping wherever it finds vent.

From comparative study of the Devonian rocks of New York, Pennsylvania and Ohio, it appears that the black shales of the Middle and Upper Devonian present the thickest mass along a belt running obliquely from Livingston and Genesee counties, across Wyoming, Allegany and Cattaraugus counties, to the oil belt of Western Pennsylvania.

West of this belt the Middle Devonian rapidly thins out and the black shales occur higher up in the Devonian series, while the green shales found in the lower Portage strata of Wyoming county, and interstratified with black shales become the characteristic rocks of this horizon in Ohio.

There is also along this same belt a special development of coarse sandstone, terminating the Devonian black shale series, and called Portage sandstone, where it outcrops in New York.

Passing eastward this sandstone becomes fine and shaly, and is lost sight of east of Canandaigua Lake.

Going west of the same belt it is also lost sight of, but the Panama conglomerate at a higher geological horizon presents similar conditions for the accumulation of gas or oil, and the Le Boeuf sandstone of Western Pennsylvania, and the Berea grit in Ohio, are each in its area caps of porous sandstone over the Devonian black shales.

The black shales are, with little doubt, the source of the carbonaceous matter for all this geographical area, while the first considerable coarse sandstone above them forms the porous reservoir necessary to the accumulation in profitable quantity of either oil or gas. These two conditions in this relation are the essential conditions for a good oil region in the Devonian and Carboniferous rocks.

The Findlay gas development was unexpected, but once given the fact that the Trenton produces gas, and the geological structure at Findlay and in the neighboring gas area is precisely that in which the best yield of gas should be expected. For there is the old anticlinal fold called the Cincinnati axis, forming a broad, but closed dome for the collection and holding of all the gas escaping from the lower rock.

In Western New York, although there are slight low folds, the whole inclination of the rocks is southward, and there is no reversal of the dip to form an anticlinal or large dome until the limits of the state are reached.

From these facts it results that if there were gas originally formed in the Trenton, under Western New York, there is nothing in the geological structure to suggest that any considerable reservoir of gas is there at the present time. Such are the indications from a study of the surface rocks of the region.

And when we take into account the thickening and thinning of the respective formations, now in one direction, now in another, it is seen to be practically impossible to predict the precise topography of the surface of the Trenton limestone.

So that, even were we to presume that the Trenton

yields gas, and that there were reservoirs of it, no one could tell without boring down over 3000 feet along Cattaraugus creek, where the reservoir is. It is pretty safe to say, however, that all the *gas indications* for Southwestern New York do not point to the Trenton limestone, three to six thousand feet below the surface, but to the bituminous black shales which are within a thousand feet of the surface for most of this region.

In the southern part of Cattaraugus county, both from the higher elevation of the surface and by the gradual dipping under of the strata, the black shales, with the capping sandstones, (Portage, or other layers in the Chemung,) are low enough to be reservoirs of oil and in some cases also yield gas.

But judging from the general law of change in the sandstones from coarser to finer grain on passing from this belt northward, it is not probable that any rich reservoirs of either gas or oil will be found either in the northwestern half of Cattaraugus county, or in the northwestern three-quarters of Chautauqua county.

Whatever gas is, or is likely to be discovered in this territory, is the low pressure gas, arising directly from the black shales of the Middle and Upper Devonian, and from a geological point of view, search for gas below the Corniferous limestone would be a venture, not encouraged by the facts at present known about the rocks of the region.

Crude Market for May.

The crude market remains destitute of all interesting features. The Exchanges devoted exclusively to dealing in crude certificates wear a dull and listless air, and their volume of business is constantly shrinking to smaller proportions. Many oil brokers have already realized that "their occupation's gone" and have sought and found new channels for their endeavors. A few are to be found who still indulge in rose-colored dreams of a future in which the market will start upwards on a rapid career towards the dollar point. The price of Lima oil has suffered a farther reduction to 25 cents a barrel, and to the Ohio producer the outlook is yet more discouraging than to the Pennsylvania. The statistical situation remains favorable to an advance. There is nothing at present outside of Ohio from which increased production may be expected in the immediate future. Taylorstown may be regarded as an undetermined factor, but its productive capacity will hardly do more than help sustain the waning yield of the Washington field. Russia is again being used as a bear argument against the American product, and numerous reports are in circulation of its steady encroachments on our foreign trade.

The opening quotations in the crude market for May were 65½c, 66c and 66¼c. There was a fairly steady feeling afloat, which culminated at 67¼c on the 3d of the month. From this time on the decline was steady with a general lack of interest everywhere. On the 18th the price touched 61½c, which was the lowest for the month. It was again reached on the 27th, and ranged for several days between 61½c and 63c. On the 27th there was a small rally to 64¾c, which was soon lost, and the month closed with 63¼c bid at New York, Pittsburgh and Bradford, and 63¾c at Oil City. The highest price for April was 69c and the lowest 62¾c. The fluctuations for March were between 65¾c and 61¾c.

The range of prices for May was 5¾c as compared with 6¾c in April, 4c in March 9¾c in February, and 4¾c in January. The average price on the floor of the Bradford Exchange was 64c in May, 64½c in April, 63¼c in March, 63¾c in February, 71c in January, 71c in De-

cember, 72c in November, 65½c in October, 63¾c in September, and 62c in August. The average price for May one year ago was 69¾c.

THE CLEARANCES.

	May. Barrels.	April. Barrels.
Bradford Oil Exchange.....	14,868,600	13,166,000
Oil City.....	33,828,000	31,312,000
New York Consolidated Exchange.....	91,328,000	82,902,000
Pittsburgh Petroleum Exchange, est.....	36,549,000	34,428,000
Philadelphi. Oil Exchange, est.....	.....	7,500,000
Total.....	176,573,000	169,308,000

The Macksburg Field in May.

The production of the Macksburg field, estimated from the pipe line runs, the shipments of the West Virginia Transportation Company, etc., averaged about 229 barrels a day for 1884. The gross runs of the Macksburg pipe line since January 1, 1885, with the estimated amount of oil shipped from the field through other channels is given below. The averages represent the best obtainable figures on the production of the field:

1885.	Macksburg P. L. Runs.	Outside Shipments. Est.	Daily Average Production.
January.....	11,894	1500	432
February.....	20,625	1500	790
March.....	27,067	1500	922
April.....	40,527	1500	1400
May.....	48,258	1500	1605
June.....	64,982	1500	2216
July.....	75,737	1500	2492
August.....	74,228	1500	2443
September.....	68,110	1500	2320
October.....	63,619	7000	2278
November.....	60,926	7000	2264
December.....	61,113	7000	2197
Total.....	617,086	34,500	1785
1886.			
January.....	54,806	7000	1994
February.....	49,694	7000	2025
March.....	58,795	8973	2186
April.....	64,137	7890	2401
May.....	58,596	6650	2104
June.....	65,379	2871	2275
July.....	58,410	4080	2016
August.....	57,492	2790	1945
September.....	48,918	1240	1672
October.....	46,937	3240	1619
November.....	41,359	4090	1515
December.....	40,578	3040	1407
Total.....	645,101	58,844	1682
1887.			
January.....	37,134	4500	1343
February.....	28,514	1200	1061
March.....	32,549	7400	1015
April.....	29,128	4200	1110
May.....	24,780	1500	970

Two wells were completed in the Macksburg field in May, one of which is doing 20 and the other 5 barrels a day. R. F. Boreckman's No. 3, on the Wagoner farm, started at 80 barrels; it is located in the southern part of the field and opens up a small extension in that section. Boreckman, Roser Brothers and Reeder & Payne have rigs up in the vicinity ready for drilling, which includes all present operations in the field. But one well was completed in April and none in March.

On the 31st of the month there were 468 producing wells in this field with a total yield of 970 barrels. At present there are twelve wells that have stopped flowing from various causes, and some of them will never be started up again. No wells were abandoned during the month.

THE EUREKA DISTRICT.

At Eureka, W. Va., B. F. Ney, on the Biddle farm, was drilling at a depth of 950 feet June 1st. Barnsdall & Brown have rigs up on the Hammett and Cochran farms ready to start the drill. It is supposed that they were built to stop rentals and may stand for a long time, before operations commence. At the Brown, No. 2, nothing has been done but to attach an oil saver and make preparations for opening up the well.

RUSSIAN PETROLEUM TRADE.

REPORT OF CONSULAR AGENT CHAMBERS, OF BATOUM.

[CONTINUED FROM PAGE 1618.]

COUNTERFEITING AMERICAN MARKS.

IN the case trade of Batoum, the American trade marks have been extensively counterfeited, but I am pleased to say only by three or four of the smaller dealers. The large dealers and refiners have been working with a view of establishing a trade that can be depended upon in the future, and consequently have exported the best refined they could purchase or manufacture under their own trade marks. The parties who have counterfeited the American trade marks have always sold under these marks the very cheapest refined obtainable, depending entirely upon the marks to sell the goods, consequently it is not at all surprising that complaints of the quality of American oil have been heard from time to time in the past three years from the Levantine ports. There can be no doubt that most of these complaints were caused by the ignorance of the consumer in being deluded by the almost fac-simile American marks upon Russian petroleum. The American brands most favored by Russian counterfeiters were Pratt's "Radiant" and "Astral." The owners of these brands have recently registered them in Russia, and will, I am informed, soon commence civil and criminal legal proceedings against the parties who have engaged in this disreputable business.

RAILWAY FROM BAKU TO BATOUM.

The railway from Batoum to Baku is 560 miles long, and is an exceedingly expensive road to operate, owing to the heavy grades in crossing the mountains. The highest point upon the road is the Suram Pass, about 135 miles east of Batoum, which is over 3000 feet above the level of the Black Sea. Upon the west side of the mountain the average grade for $3\frac{1}{2}$ miles is 185 feet to the mile, and $1\frac{1}{2}$ miles of it is 238 feet to the mile. Upon the east side of the mountain there is a grade of 253 feet to the mile, but the greatest grade shown by the official statistics is 238 feet to the mile for nearly 2 miles, while the average grade for 6 miles is 210 feet to the mile. Work will soon be commenced upon a tunnel, or rather two tunnels, a long and a short one, through the mountain at Suram, which when completed will materially lessen the grade. The long tunnel will be almost 3 miles, and, as the contour of the road will have to be changed materially for 10 to 12 miles, it is estimated that the work will require about four years for its completion. There is some talk about the railway capacity being temporarily increased next year by double-tracking the road over the pass, but this would also require a great deal of time and money, and I have been reliably informed that nothing of the kind is contemplated by the company. The railway company is steadily adding new tank cars to its rolling stock, and its said by January 1 there will be 500 more tank cars in service than at present, while early in 1887 350 more will be put in service by two large refining firms. How much these additions to the tank car service will increase the petroleum carrying capacity of the railway I am unable to say. It requires about one hour and twenty-minutes for a passenger train to cross the Suram Pass, a distance of 10 miles, and for a freight train nearly two hours; and with a constantly increasing general freight business it would not seem that the petroleum carrying capacity

could be increased materially. The price charged by the railway for transporting oil from Baku to Batoum is, at present rate of exchange, about 1.4 cents per gallon, and the yard charges, etc., at Batoum will increase the price to about $1\frac{1}{2}$ cents per gallon.

PIPE LINE.

For some years there has been a great deal of talk about a pipe line from Baku to the Black Sea, but until this year it was contended by well advised people that a concession for the purpose of constructing a pipe line would never be granted by the Russian Government, because it had guaranteed the interest upon the bonded debt of the Transcaucasian Railway, and until last year always had a large amount to pay for this guarantee. It was argued that such a concession, which would deprive the railway of a large proportion of its earnings and thus proportionately increase the annual deficit to be made up by the Government, would not be granted.

In April of this year, however, it was rumored in Baku that the Russian authorities had intimated to some of the leading people in the petroleum trade that a pipe line concession was to be granted, and that a committee of the ministry had been appointed to devise ways and means for the construction of the line. Nothing more was heard of the project until very recently, and now one hears of little else, although the Baku trade is by no means unanimously in favor of the project. Here in Batoum one hears nothing favorable, and a great deal against such a pipe line. It is claimed the construction of the line by the people most interested, *i. e.*, the trade itself, is out of the question, because of its impoverished financial condition. It must then be constructed by foreign capital or the Government, and although at present the hopes of the trade are based upon the construction by the Government, no one believes that there is the remotest chance of the Government constructing it, because it would not be of the slightest use for military purposes. The people here say the scheme cannot be presented to foreign capitalists in a favorable light for the following reasons: •

The project generally considered is for a line of 7 or 8 inch pipe for refined only, as the quality of the crude and the present large investment in refining plant at Baku make piping crude out of the question. (At present, however, there is a great deal of talk about a crude line to be constructed by the railway company.) The amount of money necessary for the construction of such a line is variously estimated at from \$7,000,000 to \$10,000,000, and those familiar with the manner in which work is done in Russia will always take the greater sum for a basis of calculation. Giving a line of this size its maximum capacity, to allow a fair interest upon the investment, say 5 to 6 per cent., there could be no great reduction from the present railway freight rate. It is not believed, however, that its maximum capacity would be reached before two or three years from its completion, and consequently no reduction in freight could be made for several years, and the only advantage accruing to the trade from the construction of the line would be the very questionable one of increased facilities for reaching the markets with an article with which they are already oversupplied. Looking at the scheme from an investor's standpoint, the fact will not be overlooked that, unlike a railway, which creates traffic, a pipe line is entirely dependent upon the one product for its maintenance, and the failure of that product means total loss of investment, as the value of material of this description, providing a market could be found for it, would hardly pay for the expenses of its removal. It

is, of course, generally believed that the supply of petroleum at Baku is everlasting, but it would not be an easy task to convince capital that this was the case; therefore a pipe line investment would hardly be called a legitimate one, but a speculation. Such a speculation might be justified by a certainty of from 15 to 20 per cent. interest upon the investment the first year or two, but with a certainty, on the contrary, of not more than 5 per cent. under the most favorable circumstances it would be ridiculous. The present unsettled condition of European politics is also a serious obstacle in the way of the carrying out of this project. Foreign capitalists are not likely to make a great investment in Russia at present, especially as such an investment would necessarily have to be made in the name of Russian subjects, as Russia grants no concessions to foreigners. Of course these arguments seem very strong against the project, but in this country, as I have said before, results are not generally considered, and the unexpected is always happening. If the pipe line is to be constructed, I am sure the American pipe manufacturers can, with proper attention to the matter, secure the contract for making the pipe, and it seems that such a contract at present should be worth looking after.

PRESENT SITUATION.

The present condition of the Russian petroleum business is not all encouraging. Financially it is in very deep water, and it is difficult to see any way out. The fact is, the industry is suffering from too much misdirected energy, which is a remarkable thing in Russia. The energy of the trade in the past three years has been directed against the American product, and in the efforts of the Russians to drive the American article out of the markets of Europe the home trade has been badly mismanaged.

In Russia, with a population of 91,000,000, where the home product is protected by a duty of 11 to 12 cents per gallon, it is generally conceded that the legitimate manufactures of illuminating oils have reaped no profit financially in the past two years, owing to bad commercial management and a ruinous competition among themselves. The prices at Baku have ruled low the whole of the present year, and at the present time, in the midst of what is usually the busy season for export, refined is only worth from 1 2-5 to 1 4-5 cents per gallon f. o. b. (at Baku), the price varying according to the necessity of the seller. At these prices there is no margin of profit for either producer or refiner, and when in a few weeks the navigation of the Volga is stopped by ice for the winter, prices must decline still further. Failures in the trade are always expected, and just now rumors are numerous regarding the financial weakness of some of the largest producers and manufacturers in the trade. At Batoum prices are a trifle higher proportionately than at Baku, owing to the lack of railway transportation, and there is a prospect of a scarcity of refined among the smaller exporters there before January. The large exporters, like Nobel and Rothschilds, prepared for the winter trade by buying from smaller refiners for future delivery at Batoum, thereby securing the transportation allotted these smaller refiners by the railway committee.

EXPORT TO AUSTRIA-HUNGARY.

One branch of the Russian trade, however, is apparently profitable (I say "apparently," for that it is really profitable is denied by many dealers and exporters), that is, the exportation of so-called crude oil to Austro-Hungary, which it has been incorrectly stated is due to the tariff laws of that country favoring the Russian article.

The crude oil tariff of Austro-Hungary, although lower for Russian oil (or, more strictly speaking, for an oil of heavier gravity than 38° Beaume) than for American, owing to the great difference in the illuminating qualities of the two oils, is not a discrimination against the American crude. The discrimination against the American crude consists in the fact that Russian distillate, which is a manufactured oil, is allowed to enter Austro-Hungary as crude oil, and by paying crude oil duty. This is not done secretly, but openly, and of course with the consent of the Government. The combined chemical skill at Baku (and Hungary, too, perhaps) has for some time past been directed to experimenting with a view to discovering the most profitable combination of distillate and residuum for Austro-Hungarian export that will not be lighter than 0.830 specific gravity (38° Beaume), and the result is an article containing 90 per cent. illuminating distillate and 10 per cent. astatki, the latter being valuable for fuel. Consequently the Fiume and Pesth refiners, instead of paying the lawful duty upon an article that will yield only 30 per cent. refined oil, are getting for that duty an article that will yield three times as much illuminant, with less labor, time and expense, and this business certainly should be profitable.

The volume of this export is so rapidly increasing, and it so directly affects the American petroleum interests, that it seems but right and proper that the Department of State should be advised of it in order that it may obtain the attention of the American petroleum exporters and arouse them to a realization of the proportions which this unfair competition may attain. Consul General Jussen gives the Austro-Hungarian import duties upon petroleum as follows: Crude, of 0.830 specific gravity and heavier (39° Beaume), at 12° Reaumur, 1.10 florins (gold) per 100 kilos; crude, under 0.830 specific gravity, 2 florins (gold) per 100 kilos; refined, 0.870 specific gravity and under (31° Beaume), 10 florins (gold) per 100 kilos.

Natural American crude, which yields from 70 to 85 per cent. illuminant, comes under the 2 florins rate of duty; while natural Russian crude, which yields only 27 to 30 per cent. illuminant, comes under the 1.10 florin rate of duty, and cannot possibly compete with either American crude or the heavier native Austrian product from the Galician wells.

The article exported from Batoum and admitted as crude oil at Fiume, paying the 1.10 florins per 100 kilos duty, is not a natural crude (nor is crude oil used in its composition), but is a combination of manufactured oils prepared solely for the purpose of defrauding the Austro-Hungarian revenue.

Russian illuminating distillate is much heavier than American, about 0.823 specific gravity (40° Beaume), and experiments made for the particular purpose have resulted in the preparation of a heavy and valuable lubricating oil distillate (the Austro-Hungarian duty upon which is 1.90 florins (gold) per 100 kilos), which is mixed with illuminating oil distillate in the proportion of 15 and 85, 10 and 90, and in some cases it is boasted 5 and 95, thus forming an article of 0.830 specific gravity or heavier, which will yield 100 per cent. valuable merchantable products, which, as before stated, is admitted at Fiume at the same rate of duty as the law requires for a natural oil which will not yield over 50 per cent. merchantable products in Austro-Hungary.

Taking the average mixture as 10 per cent. lubricating distillate, and 90 per cent. illuminating, the gain to

Austro-Hungarian importers of this article is as follows (in gold florins):

Duty upon 90 kilograms refined oil, at 10 florins, gold.....	9.00
Duty upon 10 kilograms lubricating distillate, at 1.90.....	1.90

Amount of duty actually due on 100 kilograms.....	9.19
Amount of duty actually paid by importer.....	1.10
Internal tax upon 90 kilograms, refined, at 6.50 florins, paper, 100 kilograms in gold florins.....	4.68

Net gain to importers per 100 kilograms (gold).....	3.41
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The export of this article in the month of November was over 1,000,000 gallons, while this month it has reached already 1,800,000 gallons, with another steamer loading.

Estimating 30 gallons to 100 kilograms, the export for December will amount to 600,000 kilograms, and the amount of profit derived by the half dozen importers, or perhaps more properly the amount of the Government subsidy given them (as it appears like a subsidy), is 204,600 gold florins, or over \$100,000 in one month, so that it is not at all surprising that such a profitable business is growing rapidly.

At present there are, regularly in this trade, four steamers carrying the stuff in barrels, one steamer carrying it in bulk, with another bulk carrying steamer expected very soon, while a number of sailing vessels are occasionally employed.

At Baku and Batoum no efforts are made to disguise the character of this export, but on the contrary it appears to be a source of great pride to those engaged in the business, and no pains are spared apparently to publish this evidence of the remarkable favor which the few people profiting by this subsidy are in with their Government.

It is cleared through the Batoum custom house as distillate, and with such notoriety here it is impossible that the Fiume customs officers are ignorant of the fact that instead of it being a natural crude oil it is a combination of manufactured oils; consequently it behooves the American petroleum exporters, whose natural crude petroleum this Russian manufactured article is rapidly displacing in Austria-Hungary, to look this matter squarely in the face (if they have not already done so), and recognizing as a fact that this unjust discrimination against them meets with the approval of the Austro-Hungarian Government, prepare, if possible, to protect themselves against it.

VOLUME OF PETROLEUM BUSINESS.

From the following statistics an idea of the volume of the Russian petroleum business can be formed:

Shipments of Petroleum Products from Batoum from January 1 to September 30, 1886, (new style January 12 to October 12, in gallons.

To—	Illuminating oils.	Crude residuum.	Lubricating.	Total.
January (not given separately).....	3,469,085	708,200	858,750	4,986,015
England.....	1,075,000	90,000	1,820,185	2,985,185
Germany.....	835,000	178,200	516,500	1,529,700
Austria-Hungary.....	4,433,380	2, 67,240	130,000	6,680,620
Belgium.....	1,527,750	450,050	355,250	2,313,050
Denmark.....	200,750	.....	.....	200,750
France.....	1,458,400	411,490	1,034,845	2,884,735
Italy.....	2,181,000	755,800	292,400	3,229,200
Turkey.....	7,538,285	1,000	5,155	7,544,420
Greece.....	418,500	.....	1,750	420,250
Algiers.....	282,000	.....	.....	282,000
Roumania.....	4,470,410	22,500	53,650	4,546,560
Egypt.....	765,000	.....	.....	765,000
Spain.....	308,000	.....	.....	308,000
Holland.....	.....	.....	120,000	120,000
Total exported.....	29,023,520	4,894,480	4,751,485	38,669,485
Shipped to Russia.....	8,082,035	25,650	572,555	8,730,240
Total shipments.....	37,105,555	4,920,130	5,324,040	47,350,725

Shipments of Petroleum Products from Baku via Cas-

pien Sea, from January 1 to September 30, 1886, (new style January 12 to October 12), in gallons.

Description of oil.	To Russia.	To Persia.	Total.
Illuminating oils.....	82,555,925	577,460	83,133,385
Crude.....	11,997,210	302,150	12,299,360
Crude residuum (fuel).....	143,671,290	106,230	143,777,520
Lubricating oils.....	670,740	.....	670,740
Benzine.....	134,200	.....	134,200
Solar oil.....	403,680	188	403,868
Solidified residuum (poods, 1250).....	.....	.....	.....
Total.....	238,863,045	980,028	239,843,073

Exports of Petroleum Products from Batoum, 1885, in gallons.

To—	Illuminating oil.	Crude residuum.	Lubricating.	Total.
England.....	1,748,300	187,550	1,239,525	3,175,375
Germany.....	250,000	.....	40,100	290,100
Austria-Hungary.....	3 281,570	.....	613,115	3,894,685
France.....	1,056,125	198,500	1,211,570	2,466,195
Spain.....	12,000	.....	.....	12,000
Italy.....	3,239,470	75,000	980,740	4,295,210
Turkey.....	11,843,950	205,400	13,100	12,062,450
Roumania and Serva.....	5,197,060	.....	.....	5,197,060
Holland.....	.....	.....	10,000	10,000
Other countries.....	236,850	.....	.....	236,850
Total.....	26,865,325	668,450	4,108,150	31,639,925

Official Custom House figures for the export of Petroleum Products from Russia, first seven months of 1885 and 1886, in gallons.

Port.	Year.	Refined.	Crude residuum.	Lubricating.	Crude.	Total.
Batoum.....	1885	16,025,000	520,000	935,000	.....	17,280,000
.....	1886	20,000,000	3,945,000	3,945,000	375,000	27,815,000
Novorossisk.....	1885	.....	.....	.....	500,000	500,000
.....	1886	180,000	70,000	.....	55,000	305,000
Baku.....	1885	400,000	125,000	.....	390,000	915,000
.....	1886	980,000	105,000	.....	165,000	1,250,000
Totals.....	1885	16,425,000	445,000	935,000	890,000	18,695,000
.....	1886	21,160,000	3,670,000	3,945,000	595,000	29,370,000

NOVOROSSISK AND ILISKY.

The petroleum operations in Russia, next in importance to those at Baku, have been at Ilisky, about 50 miles east of the port of Novorossisk, which is 250 miles north-east of Batoum, upon the northeastern coast of the Black Sea. I speak of these operations in the past tense, because at present little or nothing is being done at this place.

In this vicinity, oil, of different qualities and insignificant quantities, was found a great many years ago, but no operations worthy of consideration were commenced until about the year 1873, when a Colonel Novosiltsoff began operations upon land leased from the Russian Government. Owing to Colonel Novosiltsoff's financial difficulties, however, his leases passed to an American, who organized a company in Marseilles and commenced working near Ilisk in the year 1878. In a few years, however, the Frenchmen became dissatisfied with the management of the American, endeavored to get the business out of his hands; but finding this impossible by law, owing to the brilliant management of the American, they paid him a large sum of money for his interest, and obtained exclusive control of the business, illustrating the old story of combination of money and experience ending with experience and money. This American is, I believe, one of the very few men, if not the only man, who has made money out of the Russian petroleum business.

The area of the territory developed at Ilisky is not more than one mile square, upon which 70 wells have been drilled, almost all of which were producers, in limited quantities, of crude oil of various qualities. The greater number produced from a depth of 100 to 600 feet, small quantities of very heavy oil, from 0.9722 to 0.9459 specific gravity (14° to 18° Beaume). A few, however, produced a lighter crude, 0.8860 to 0.8641

specific gravity (28° to 32° Beaume), from depths varying from 400 to 800 feet. One well was drilled to a depth of 1200 feet, but was not a profitable producer. Only one well produced largely, and it is claimed commenced flowing at the rate of 1000 barrels per day, but declined rapidly, and soon stopped entirely, owing, it is said, to the fact that the pipe in it was too small, and consequently was soon filled up with mud.

A three-inch pipe line from Ilsky to Novorossisk was constructed in 1881 and 1882, and with three pumping stations. The pumps were of English manufacture, and the pipe Scotch, and although the greatest elevation to overcome was only 700 feet, and the Novorossisk terminus much lower than Ilsky, the line was a failure, owing to the quality of the oil to be pumped, and the inferiority of the pipe and pumps. Three more pumping stations were added, with American pumps, making six in a distance of 47 miles. The new pumps were too powerful for the pipe, and the result is that the line, although occasionally operated, consists now principally of flange unions.

Tanks were constructed at Ilsky and Novorossisk to hold 100,000 barrels of oil. A refinery of 300 barrels per day capacity was erected at Novorossisk, and also docks, machine shops, laboratories, all upon a grand scale. At Ilsky stills were erected to heat the oil, as it was found impossible to pump it without heating it and extracting as much of the water from it as possible, but it requires distillation to thoroughly extract the water from the oil.

The administration of the company at Novorossisk and Ilsky was remarkably large and complete. There was no lack of "general" officers and "sous" officers, all wonderfully proficient theoretically, but all practically ignorant of the petroleum business. The work of drilling and pipe line construction was performed by Americans of great experience in the business, but of course badly hampered by the ignorance and theories of their superior officers, and bad material furnished them. Notwithstanding all the difficulties they had to contend with, they worked very successfully, drilling, as I have before stated, one well to the depth of 1200 feet, and many others 800 and 900 feet.

The revenue of the company was derived principally from assessments upon the stockholders. It had, however, a limited market in the spring and autumn for heavy oil at Ilsky, to which place at these seasons, carts from the Kuban river country came in great numbers and took this heavy oil for fuel and axle grease, using it in its crude state for both purposes, as their axles are made of wood. It was also shipped in such small quantities as it was possible to push through the pipe line to Rostoff, on the Don, and there sold generally at a loss. Some was shipped to Marseilles, the headquarters of the company, for experimental purposes, and from the fact that very little was sent there, and shipments have now ceased, it is fair to presume that the result of the experiments with it was unsatisfactory.

There was very little refined petroleum made at Novorossisk, as the heavy oil would not yield any illuminant, and the production of the lighter crude was always small and very uncertain, and this crude also contained a very small proportion of illuminant. There is a story which every new-comer in this country hears about some shallow wells in this vicinity many years ago producing crude containing 35 per cent. illuminant, but confirmation of this legend is impossible. Of course a diversion like this could not go on forever, for stockholders, although not tiring very easily, must eventually become exhausted. In October last year all the

American employes but one were discharged and expenses greatly reduced by an almost entire cessation of drilling, after an investment of over \$2,000,000 had been made.

In May last this \$2,000,000 was represented by a production of 175 barrels of 28° Beaume crude per day from fourteen wells, 80 barrels per day of heavy oil 14° to 18° Beaume, a forty-seven mile pipe line, which was more troublesome than useful, a refinery, large wharf, machine shops, and a number of high salaried officials at Novorossisk.

Since May it is said the production has greatly declined, and a rumor is afloat about some European capitalists going to take hold of the property; a rumor which no one believes, however, for men who have money didn't get it by taking such loads as this upon themselves when they could start afresh with better prospects.

In the neighborhood of Ilsky other parties have been and are still prospecting for petroleum in a very primitive manner without success.

There has been recently some talk by irresponsible parties of starting this French business afresh, and great stress is laid upon the advantages of the harbor at Novorossisk (for the improvement of which the Russian Government has recently appropriated a large amount of money) and the railway now building from Ekaterinodar to Novorossisk. What advantage the railway will be to the petroleum business with an imitation pipe line already constructed is not apparent, while the advantages of the harbor are also problematical, if the most experienced navigators of the Black Sea are any authority on this matter. From these gentlemen it seems that the harbor of Novorossisk being completely landlocked, the trouble does not come from the sea, but from northeast winds from shore, which are of very frequent occurrence. When this land wind commences vessels cannot enter the harbor, and the only thing for vessels in the harbor to do is to pull up anchor and get out of it.

CRIMEA.

Northwest of Novorossisk about 90 miles, in the vicinity of the town of Kertch, on the Crimean Peninsula, another French company has been prospecting for oil for some years, without success, and with very little encouragement; but upon a much smaller and more sensible scale than their countrymen on the other side of the Black Sea.

About fifteen or sixteen years ago, at a Tartar village, Kop-Kootchigan, about 20 miles south of Kertch, a heavy oil was found at a depth of 80 to 180 feet, by digging holes without the aid of machinery. The oil was obtained by skimming it from the surface of the water with which the holes were allowed to remain filled. Two years ago there were 115 of these holes, protected by barrels sunk into their tops, still to be seen, but no oil had been taken from them for twelve years. These holes and the oil springs which exist in many of the salt lakes which are found all over this part of the Crimea, it is said induced these Frenchmen to lease an immense tract of land here, several million acres it is said, and commence prospecting for petroleum of a better quality and in larger quantities. They commenced by procuring Americans of experience to do the work, and kept Americans until last February, when they suspended operations. The following is the result of their operations:

At Chingalek, about 16 miles south of Kertch, seven wells have been drilled to various depths, the deepest of

which being 940 feet and producing for a short time about 30 barrels per day of crude oil, said to contain 36 per cent. of illuminant and 30 per cent. lubricating oil. The total production of this well was only 3500 barrels, and was all the production this company ever had, as all their other wells were either totally dry or produced very little oil.

At Kop-Kootchigan four wells were drilled, the deepest being 840 feet and yielding a little heavy oil.

At Temesh, about 30 miles west of Kertch, one well was abandoned after two years' work at a depth of 870 feet.

At Zamoskaya, 25 miles west of Kertch, one well was abandoned at a depth of 500 to 600 feet.

At Karamish Kelechi, one well 790 feet.

At Tescheoli, two wells 630 and 700 feet.

This company erected a small refinery in Kertch, but, as before stated, ceased or suspended operations in January or February this year.

Across the Kertch straits, opposite Kertch, near Taman, the same Colonel Novosiltsoff, who had the immense Government concession at Ilsky, in 1863 commenced operations for petroleum with the assistance of several Americans. They commenced by erecting a large refinery, the material for which was prepared ready for erection in Glasgow, Scotland, and brought out here at an immense expense. After the refinery was ready they commenced drilling for oil, but never got any. They were enterprising, energetic people, and were bound to test the refinery; so small quantities of crude were brought in carts from shallow wells in the Kuban country, and a few runs were made from it. The refinery was abandoned and allowed to go to ruin until the French company at Novorossisk began operations, when it was leased to this company for ten years. It is said the French company leased it to prevent its being used against them by any unscrupulous person who might be induced by their success (which was assured, they thought,) to compete with them.

The only other petroleum prospecting in Russia at present is about 30 miles northeast of Batoum, near a railway station called Notanebi. Some time ago an Englishman, or an English company, bought a small tract of land, has since leased a great deal more, and commenced operations by employing an American as superintendent. Machinery, tools and material were ordered from America, and by the middle of November drilling will be commenced upon what must be a very important test well, to both Russian and American trade, as a new field on this side of the mountains would be a very bad blow for the Baku trade, and a very serious thing for the Americans to compete with.

UNITED STATES CONSULAR AGENCY.

BATOU, November 1, 1886.

Comparative Statement.

STATISTICAL SUMMARY OF THE PETROLEUM SITUATION.

	1887.	1886.
	May.	May.
Wells completed.....	146	351
New production.....	3,182	11,588
Dry holes.....	36	57
New rigs.....	81	186
Old rigs.....	107	137
Drilling wells.....	161	407
Total field operations.....	349	730
Average daily pipe line runs.....	64,522	68,602
Average daily shipments.....	69,594	64,635
Total stocks custody pipe lines.....	31,633,476	32,655,725

THE MARKET.

Refined in New York.....	6% @ 6%	7 @ 7%
Opening price of crude f r the month.....	66	73 1/4
Highest price of crude for the month.....	67 1/4	74 1/2
Lowest price of crude for the month.....	61 3/4	62
Closing price of crude for the month.....	63 3/4	62 1/2
Average price of crude for the month.....	64	69 1/2

OIL REGION CHRONOLOGY.

FOR MAY, 1887.

May 1.—Sunday. AGE oil report shows 169 wells completed in April, 43 of which are dry; new production, 6238 barrels; new rigs, 79; old rigs, 119; drilling wells, 158; total field operations for April, 356; decrease from March figures, 9. Pipe line reports 54 wells completed in the Ohio field in April, and 53 drilling and 47 rigs for May 1st. Buckeye Pipe Line have 40 storage tanks filled with Lima oil. Two children of David Sherman fatally and one seriously burned by explosion of lamp, while parents were at church at Fairmount, Clarion county. New rules of the National Transit Company go into effect reducing storage charges from 40c to 25c a day per 1000 barrels of oil, and 3 per cent. allowance for sediment and surplus to 2 per cent. Tank No. 1, at Lima, Ohio, of the Buckeye Pipe Line Company, filled with 35,000 barrels of Lima oil, struck by lightning and destroyed. Several small tanks and Clemenger's well, No. 2, on Faze farm, were also burned. A two thousand barrel well reported from Henry township, Wood county, near Bowling Green, Ohio.

May 2.—Market opened at 66c, advanced to 66 1/2c, sold down to 65 1/2c and closed at 66c. Carrying rates—Bradford, 35 @ 40c; New York, 40c; Oil City, 37 1/2c; Pittsburgh, 45c. Washington—Campbell, No. 2, Wade, 40 barrels an hour; Union, Morgan, No. 8, 10 feet in 50-foot and doing 75 barrels a day; McKeown, Munce, No. 15, through Gantz sand without oil. Warren producers appoint delegates to the Oil City convention. Large meeting of Bradford producers at the Oil Exchange, at which the Harrisburg resolutions were adopted and delegates appointed to attend the Oil City convention of May 5. Bursting of an emery wheel at the United Lines shops, Kendall, seriously injures Burt Ganning and causes the loss of his right leg. A fire in Chas. Duffey's store, at Butler, causes a loss of \$4,000.

May 3.—Market opened at 66 1/2c, advanced to 66 3/4c, broke to 66c, firmed up to 66 5/8c, receded to 66 1/2c, then advanced to 67 1/4c and closed at 66 5/8c bid. Price of Lima oil reduced to 27 1/2c per barrel. Washington—Campbell, No. 2, Wade, 38 barrels an hour; Morgan, No. 8, made 127 barrels last twenty-four hours. Another large gas well reported from Muncie, Indiana. Excitement over reported oil strike at Zoar, near Gowanda, N. Y. Conspiracy suit of C. B. Matthews against Everest, Rockafeller, Archbold and others of the Standard Oil Company, on trial at Buffalo. Five men attack Jacob Wagner at his farm house, near Tionesta, and one of them is killed and another fatally hurt in the encounter.

May 4.—Market opened at 66 5/8c, rallied to 66 7/8c, declined to 65 1/2c and closed at 65 7/8c. Carrying rates 35c to 45c. Markle, No. 9, 50 barrels an hour. Phillips well, on Mays farm, three-quarters of a mile in advance of Reibold development, showing for dry hole. Washington—Wade, No. 2, upon being agitated, made 615 barrels in fifteen hours; McKeown, Munce, No. 15, drilling in 50-foot with hole full of oil. Break in the Tidewater pipe line, where it crosses the Delaware river, at Belvidere, N. J.

May 5.—Market opened at 66c, with sales at 66 1/8c, broke to 65 3/4c, advanced to 66 3/4c and closed at 66 1/2c. Washington—Wade, No. 2, 36 barrels an hour; Barre, No. 13, through sand and doing 330 barrels a day; Martin, No. 4, 375 barrels. Reibold—Root & Johnson's No.

1, Blakeley, and Phillips, Markle, No. 5, with two tanks of oil, destroyed by fire. Important meeting of oil producers at Oil City. L. Cushing shoots a burglar who had feloniously entered his store on Kennedy street, Bradford, but thief escapes.

May 6.—Market opened at $66\frac{1}{2}$ c, advanced to $66\frac{3}{4}$ c, sold off to $66\frac{3}{8}$ c, and towards close declined to 66c and closed at 66c bid. Carrying rates 35c to 45c. Reibold—Field gauge 4528 barrels from 59 wells. Phillips, Markle, No. 9, 780 and No. 7, 720 barrels last twenty-four hours. Heavy thunder storm at Titusville, during which a house is struck by lightning and two ladies injured.

May 7.—Market opened steady at 66c, rallied to $66\frac{3}{8}$ c, declined to 66c, advanced to $66\frac{5}{8}$ c and closed at $66\frac{1}{2}$ c. McGraw run well, near West Alexandria, W. Va., reported a failure. Washington—Field gauge 8228 barrels from 180 wells, including four at Taylorstown, which are producing 543 barrels a day. Dennis Curren, a Titusville boiler maker, seriously burned by an explosion at the Penn refinery, Oil City. Public reception in honor of Senator Emery's return from Harrisburg. Bradford wins its first game of ball in the State league championship, at Williamsport, defeating the Williamsport team 15 to 0.

May 8.—Sunday. Highland Oil Company's well, warrant 2033, Elk county, tubed and good for 20 barrels a day. Best well yet found in Elk county. Fee, No. 3, Ridenour farm, Lima, reported at 90 barrels an hour. Window Glass Works, at Homestead, near Pittsburgh, destroyed by fire caused by natural gas explosion; loss, \$60,000.

May 9.—Market opened steady at $66\frac{1}{2}$ c, ranged between $66\frac{1}{4}$ c and $66\frac{5}{8}$ c and closed at $66\frac{3}{8}$ c. Carrying rates 35c and 40c. Washington—Robinson & Guffey well, McMannis farm, Taylorstown, makes a strong flow from top of sand. Campbell's, Wade, No. 2, 30 barrels an hour. Patrick McNulty, a driller at West Kane, McKean county, committed suicide by inhaling gas from a tank of oil, on the Rathbone & Mallory lease.

May 10.—Market opened at $66\frac{3}{8}$ c, highest point of the day, sold off gradually with few reactions to $65\frac{1}{2}$ c and closed at $65\frac{5}{8}$ c. Solar, No. 24, Shannopin, starts at 900 barrels a day. Washington—McKeown, Munce, No. 16, showing for small gasser; Martin, No. 4, 400; Davis, No. 7, 550 barrels a day. Considerable land is being leased about the mystery well in the so-called Zoar oil field, Cattaraugus and Erie counties, New York. Death of Lizzie Simons at a house of ill fame, Bradford, from an overdose of morphine. Formal opening of the Bradford Hospital; speeches by R. B. Stone, Rev. Edward Bryan and others. Willie Hanna, aged 10 years, suffocated in an abandoned shaft at Siverlyville, Venango county.

May 11.—Market opened at $65\frac{5}{8}$ c, advanced to $65\frac{7}{8}$ c, sold down to $63\frac{7}{8}$ c and closed at 64c. Pittsburgh and New York the heaviest sellers. Carrying rates 35c and 40c. Guffy well, on McMannis farm, Taylorstown, through sand and made 140 barrels first nineteen hours. Henry Ely, a boy of 14, accidentally shot by Wilbur Lewis, at Washington, Pa., and died in a few minutes.

May 12.—Market opened weak at $63\frac{7}{8}$ c, weakened to $63\frac{1}{2}$ c, advanced to $64\frac{5}{8}$ c, sold off to $63\frac{3}{4}$ c and closed at 64c bid. Phillips, Galebaugh, No. 3, started at 90 barrels an hour. Markle, No. 9, drilled deeper and starts up at 95 barrels an hour. Mrs. John McDonnell, wife of proprietor of United States Hotel, Titusville, commits suicide by hanging.

May 13.—Market opened at 64c, moved up to $64\frac{1}{4}$ c,

sold off and closed at $63\frac{5}{8}$ c. Reibold—Phillips, Galebaugh, No. 3, dropped to 58 and increased to 90 barrels an hour; Markle, No. 9, 52 barrels an hour. Field gauge 6071 barrels from 60 wells. Burchfield, on Behm, made 384 barrels last twenty-four hours. Washington—McKeown, Munce, No. 16, drilling in 50-foot and flowing 100 barrels a day.

May 14.—Market opened weak at $63\frac{5}{8}$ c, declined to $63\frac{3}{8}$ c, advanced to $63\frac{7}{8}$ c and closed at $63\frac{3}{8}$ c bid. Carrying rates $32\frac{1}{2}$ c to 40c. Washington gauge 8078 barrels from 182 wells. Happer well showing for a small producer; made 7 barrels in twelve hours. Martin, No. 4, 325 barrels in twenty-four hours. Davis, Nos. 4 and 7, 400 barrels each.

May 15.—Sunday. Jury find the Everests, of Rochester, guilty of the charges in the great oil conspiracy suit at Buffalo.

May 16.—Market opened at $63\frac{3}{4}$ c, advanced to $64\frac{1}{8}$ c, broke and closed at $63\frac{1}{2}$ c. Washington—McKeown, Munce, No. 16, 5 barrels an hour; Happer well through Gantz sand and made 18 barrels last forty-eight hours. Death of Charles Haines, an old citizen of Oil City, and a well-known oil operator of Haliday run, aged 71 years.

May 17.—Market opened at $63\frac{5}{8}$ c, advanced to $64\frac{1}{8}$ c, broke to $61\frac{7}{8}$ c and closed at $62\frac{1}{4}$ c. Lima oil reduced to 25c per barrel. Reibold—Phillips, Markle, No. 9, 35; Galebaugh, No. 3, 53 barrels an hour. Washington—Wade, No. 2, 24 barrels an hour. Oil reported to have been found at a depth of 380 feet in a well drilled for water near Jamestown, N. Y. A freight train on the B., B. & K. R. R. wrecked near Prospect Park, Bradford. A brakeman slightly injured.

May 18.—Market opened at $62\frac{1}{8}$ c, sold down to $61\frac{3}{8}$ c, advanced to $62\frac{3}{8}$ c and closed at $62\frac{1}{2}$ c. Reibold—Phillips, Markle, No. 9, 30; Galesbaugh, No. 3, 30 barrels an hour. Robert McMahon, a brakeman on the B., N. Y. & P. R. R. has his leg crushed while braking at Oil City. Bill to give Bradford Hospital \$5000 passes both houses of the Legislature. Mrs. Emma Hechtkopf run over by a team of horses at Bradford, has a leg broken and otherwise seriously injured.

May 19.—Market opened at $62\frac{3}{8}$ c, advanced to $63\frac{1}{4}$ c, sold off with many fluctuations to $62\frac{1}{4}$ c and closed at $62\frac{3}{8}$ c. Carrying rates 35c to 40c. Five producing wells at Taylorstown doing 800 barrels a day. Barn of John Friedhaber burned at Oil City; loss, \$700. Producers' Association hold a secret meeting at the Collins House, Oil City.

May 20.—Market opened steady at $62\frac{1}{2}$ c, advanced to $62\frac{3}{8}$ c, and at 12:30 broke to $61\frac{1}{2}$ c. It reacted to 62c and closed at $61\frac{7}{8}$ c bid. Reibold—Galebaugh, No. 3, 45; Markle, No. 9, 22 barrels an hour. Reibold production 5069 barrels from 60 wells. Forest fires prevail throughout the oil regions.

May 21.—Market very quiet. Opened at 62c, declined to $61\frac{1}{2}$ c, advanced to 62c and closed at 62c. Carrying rates $32\frac{1}{2}$ c to 40c. Washington production 7672 barrels from 182 wells. McKeown, Munce, No. 16, through sand and good for 125 barrels a day. New York Petroleum Exchange begins the practice of closing at noon on Saturdays. Alma, Allegany county, N. Y., surrounded by forest fires. Wilson and Haggerty, the Clarion county desperadoes, who attacked Jacob Wagner's family on May 3d, sentenced to seventeen years in the State prison. An explosion of natural gas causes fire at Burial Case Manufactory, Erie. Joseph Jeschwind, the watchman, fatally burned, and John Hegerman supposed to have been burned. Loss, \$60,000.

May 22.—Sunday.

May 23.—Market opened at 62c, remained nearly stationary all day and closed at 62¼c. Gibson & Co.'s well, Ash farm, near Gibsonian, Butler county, pronounced a failure. Six wells burned near Olean, N. Y., by forest fires. Death of Bradley E. Faunce, of Olean, aged 51 years, a once prominent oil producer of the lower country.

May 24.—Market opened at 62¼c, advanced slowly to 62½c and closed at 62¼c bid. Phillips venture, on the Marburger farm, in advance of the Reibold development, down and dry. S. W. Harley's well, between Reibold and Shannopin, down and dry. Disastrous fire at Allegany, N. Y., destroys \$15,000 worth of property, consisting of eleven stores and dwelling houses.

May 25.—Market opened at 62¼c, with a few sales at 62¾c, it fell off to 61¾c and closed at 62c. Nobel Bros' pipe line at Batoum, Russia, reported to have been blown up by dynamite. Five houses at Tarport burned; loss, \$3000.

May 26.—Market opened at 62½c, advanced to 63¾c and closed at 63¼c. Washington—Wade, No. 2, drilled deeper starts up at 30 barrels an hour. Reep & Sutton well, southwest of Callery Junction, Butler county, in inferior sand and showing for a duster.

May 27.—Market opened at 63¼c, settled back to 63c, advanced to 64c, declined to 63¾c, rallied to 64¼c, then to 64¾c and closed at 63¾c bid. Reibold production 4088 barrels from 61 wells Phillips, Markle, No. 9, shot and increased to 50 barrels an hour. Ex-Policeman S. W. Trucks, of Bradford, placed on trial at Smethport for the murder of C. E. Vosburg last January.

May 28.—Market opened at 63¾c, firmed up to 64c, broke and closed at 63¾c. Washington production 7091 barrels from 182 wells. Four wells torpedoed during the past week. Jack Boyer creates a disturbance at Oil City and breaks Officer Heuston's leg. Ohio producers organize a shut down movement to take effect June 1.

May 29.—Sunday. Burchfield, No. 2, Behm farm, Reibold, starts at 30, and increases to 60 barrels an hour from second pay streak. Sill & Odell, No. 2, Johnson, Kinzua Village, starts at 200 barrels.

May 30.—Decoration Day. No market. Big gas strike reported at Miamisburg, Ohio. Mr. and Mrs. M. Wagner meet with a runaway accident while driving to Limestone. Mrs. Wagner's collar bone was broken and Mr. Wagner bruised about the back and head. L. B. Cadwell, of Bradford, severely injured by jumping off a train at DeGulier. Jury at Smethport acquit Officer Trucks, of the charge of the murder of C. E. Vosburg. Emery band and a large crowd of people tender him congratulations on his arrival home.

May 31.—Market opened at 63¼c, advanced to 63¾c and closed at 63¼c. Carrying rates 35c and 40c. Reibold—Burchfield, No. 2, 50 barrels an hour. Phillips well, on Dunbar, 800 feet southwest of Burchfield, No. 2, down and dry. Woodburn well, Taylorstown, starts at 12½ barrels an hour. Wolf, Whittlesey, No. 2, Washington, starts at 175 barrels a day.

THE National Transit Company has erected a new relay station at McLaughlin's, near Tylersburg, Clarion county, on the P. & W. Railway. It will tap the two six inch lines of the National Transit Company, and assist the oil on its way from the lower district and Washington, to the seaboard. The next important station is at Olean, N. Y. The company is erecting two 35,000-barrel iron tanks, and will put in two eighty ton Worthington pumps. To operate these there will be a battery of six tubular boilers of 80-horse power each,

The Average Price of Crude.

The following table gives the average price of crude certificates, on the floor of the Bradford Oil Exchange, since March 1, 1879:

MONTH.	1879	1880	1881	1882	1883	1884	1885	1886	1887
January	110 1-5	95	83	92½	111½	70½	88½	71	
February	103¼	89¼	85¼	101	104½	73½	80	63½	
March	86	89	82½	80½	97½	100½	80½	77½	63½
April	78½	76½	81½	78½	92½	94	78½	74	64½
May	73½	80½	81½	70	99½	85½	79½	69½	64
June	68½	100½	81	54½	117½	68½	82½	67	
July	69½	101½	76½	57½	108	63½	96½	66	
August	67½	103½	78½	58½	108½	81 1-5	100½	62	
September	69½	95½	92½	71½	112½	78	100½	63½	
October	88½	96½	92½	93½	111½	71	105½	65½	
November	105½	91½	82½	114½	114 4-5	72½	104½	72	
December	113½	92½	83½	95½	114½	74½	89½	71	

Runs, Shipments and Stocks.

RUNS OR RECEIPTS.

PIPE LINE.	MAY, 1887.	APRIL, 1887.
National Transit Co.	1,376,834.96	1,345,877.49
Tidewater	183,207.88	177,683.06
Octave Oil Co.	2,342.00	2,527.00
Keystone Pipe Line	28,485.29	28,034.68
Pittsburgh Pipe Line	111,393.61	98,409.62
Southwest Pennsylvania	297,919.38	299,628.44
Total	2,000,183.12	1,952,160.29
Daily average	64,522.04	65,072.00

In the above runs only the oil received by the National Transit Co. directly from the wells, is included.

DELIVERIES OR SHIPMENTS.

PIPE LINE.	MAY, 1887.	APRIL, 1887.
National Transit Co.	1,880,588.58	1,601,351.25
Tidewater	222,821.19	193,167.99
Octave Oil Co.	3,270.00	1,797.00
Keystone Pipe Line	24,006.36	19,877.59
Pittsburgh Pipe Line	111,383.25	98,825.59
Southwest Pennsylvania	305,970.13	234,550.18
Total	2,548,039.51	2,149,589.60
Less oil transferred between lines	390,613.17	319,933.02
Total	2,157,426.34	1,829,656.58
Daily average shipments	69,594.40	60,988.55

In the above shipments only the oil delivered to refiners is included.

Daily excess of shipments over runs, May	5,072.36
Daily excess of runs over shipments, April	4,083.45
Daily excess of shipments over runs, March	7,933.78
Daily excess of shipments over runs, February	3,664.10
Daily excess of shipments over runs, January, 1887	8,702.88
Daily excess of shipments over runs, December	11,270.81
Daily excess of shipments over runs, November	10,818.54
Daily excess of shipments over runs, October	580.75
Daily excess of runs over shipments, September	8,057.13
Daily excess of runs over shipments, August	11,931.56
Daily excess of runs over shipments, July	5,557.20
Daily excess of runs over shipments, June	4,793.41
Daily excess of runs over shipments, May	3,967.06
Daily excess of shipments over runs, April	4,899.20
Daily excess of shipments over runs, March	4,561.80
Daily excess of runs over shipments, February	14,701.52
Daily excess of shipments over runs, January, 1886	7,825.63

NET STOCKS.

PIPE LINE.	MAY 31, 1887.	APRIL 30, 1887.
National Transit Co.	28,846,105.22	29,149,380.09
Tidewater	1,576,978.78	1,556,305.60
Octave Oil Co.	3,788.00	4,028.00
Keystone Pipe Line	37,145.05	32,666.12
Pittsburgh Pipe Line	4,471.00	4,460.64
Southwest Pennsylvania	1,164,988.48	1,173,039.23
Total	31,633,476.53	31,919,879.68

Stocks decreased May	286,403.15
Stocks increased April	112,893.77
Stocks decreased March	257,699.31
Stocks decreased February	105,988.75
Stocks decreased January, 1887	777,975.85
Stocks decreased December	357,196.56
Stocks decreased November	286,526.86
Stocks decreased October	1,790.72
Stocks increased September	214,073.99
Stocks increased August	362,632.56
Stocks increased July	188,510.62
Stocks increased June	216,583.97
Stocks increased May	110,800.44
Stocks decreased April 1886	165,635.61

RECEIPTS. DELIVERIES.

Daily average May	64,522	69,594
Daily average April	65,072	60,988
Daily average March	63,915	71,899
Daily average February	63,374	66,938
Daily average January, 1887	62,629	71,332
Daily average December	67,857	79,127
Daily average November	70,767	81,586
Daily average October	76,019	76,600
Daily average September	77,989	69,932
Daily average August	76,880	64,949
Daily average July	74,880	69,323
Daily average June	75,811	71,017
Daily average May	68,602	64,635
Daily average April 1886	64,228	69,127

NOTE.—The above figures are in barrels of 42 gallons each, and include only the pipe lines of the New York and Pennsylvania oil regions.

THE PETROLEUM AGE,

DEVOTED TO THE

INTERESTS OF THE PETROLEUM TRADE.

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THE GREAT CONSPIRACY TRIAL.

THE BUFFALO LUBRICATING OIL COMPANY VS. THE
VACUUM OIL COMPANY.

AFTER a long delay the case of the people versus Hiram B. Everest and Charles M. Everest, of the Vacuum Oil Company, of Rochester, N. Y., and John D. Archbold, Henry H. Rogers and Ambrose McGregor, of the Standard Oil Company, New York, was brought to trial before the court at Buffalo on May 3d. These five men of wealth and influence were charged with conspiracy to destroy the works of the Buffalo Lubricating Oil Company and injure its business. The array of legal talent was among the best in the State, the people being represented by District Attorney Quinby and his assistant, William L. Marcy, and the defendants by Daniel N. Lockwood, United States District Attorney; Frank Brundage, ex-Judge of Niagara county; and Theodore Bacon, William Cogswell and S. G. Outerbridge, well-known criminal lawyers of Rochester, N. Y. The court was presided over by Judge Haight.

On the 10th Mr. Brundage asked the court in behalf of the defendants, Rogers, Archbold and McGregor, to direct the jury to acquit them of this indictment and direct their discharge, on the ground that sufficient evidence had not been submitted to put them on their defense. After a lengthy discussion between the counsel the judge directed the jury to acquit Messrs. Rogers, Archbold and McGregor, and the jury rendered a verdict in accordance with the judge's command.

The case attracted a great deal of attention from the prominence and high standing of the defendants. It was given to the jury on the 14th of the month, and on Sunday morning, May 15th, a verdict of guilty was rendered. The defense immediately made a motion for a new trial and the judge decided to give the defendants twenty days to prepare their exceptions.

The story of the case, as revealed by the evidence, is briefly as follows:

The principal defendants, Messrs. Hiram B. and Charles M. Everest, engaged in the manufacture of lubricating and other oils at Rochester, N. Y., under the name of the Vacuum Oil Company, and were very successful with the business. In 1879 or 1880 Messrs. Archbold, McGregor and Rogers purchased a controlling interest in the concern for the Standard Oil Company. They paid \$200,000 for 75 of the 100 shares of stock of the concern and agreed to pay the Everests \$10,000 a year to manage the business.

In 1881 three employees of the Vacuum Company, Messrs. Albert A. Miller, Charles B. Matthews and J. Scott Wilson, left Rochester and went into the business of manufacturing lubricating oil at Buffalo, under the name of the Buffalo Lubricating Oil Company. Miller

was the practical man of the new concern, whose services were to offset the capital of his associates. He was made vice-president and was to receive \$1,200 a year. Before the works at Buffalo were completed Miller had consented to betray his new associates and work under instructions from the Vacuum Oil Company for a consideration of \$1,500 a year.

The first experiments at the Buffalo manufactory were conducted by Miller and resulted in two explosions, which came near destroying the works. He remained with the company two weeks after this when he left suddenly without explanation and remained away until March, 1883. The intervening time was mostly spent in California, where the elder Everest was interested in the canning business. The evidence showed that during this time Miller and his wife were both in receipt of considerable sums of money from the Vacuum Oil Company. When Miller returned from California he got work with the Phoenix Oil Company, and was also employed at Cleveland and Corry. In the meantime the Vacuum Oil Company had brought suit against the Buffalo Lubricating Company for alleged infringements of patents, and Miller consented to become a witness for his former friends at Buffalo. Five times he came from Cleveland to Buffalo to consult with Matthews. Matthews paid his traveling expenses, and also gave his wife money in consideration of these visits.

Miller left the Buffalo Lubricating Company in July, 1881. The firm, though greatly crippled by his loss and unable to find any one to take his place, after a year's experimenting, discovered the process of manufacturing lubricating oils. A great deal of trouble was experienced by Miller's desertion, but finally most of the difficulties were overcome.

One of the most important witnesses for the prosecution was Mr. George Truesdale, a prominent lawyer of Rochester, who testified that "Mr. Everest told him that Miller had left his employ and had gone to work for another concern in Buffalo, that Miller wanted to return and that he also wanted him to come back. Mr. Everest said he supposed I knew something of Miller's responsibilities in Buffalo as a signer of a note with Matthews, Wilson and others, and that Miller had contracted with those men to go on with them in the manufacture of oil. Everest wanted to know how Miller could get out of the Buffalo arrangements, and I suggested that Everest should buy out Miller's interest, and if he couldn't do that, the only way I saw was for Miller to leave them and take the consequences, though I thought there would be a liability for damages, as well as for debt to the Buffalo parties. Mr. Miller thought the course was uncertain, and Mr. Everest said in these words, as nearly as I can remember them: 'What if Miller should do something which would blow up the works?' I said that if it were the result of negligence or carelessness, a civil suit for damages would ensue, but if done wilfully, he would be liable for criminal prosecution. Mr. Everest said he knew I had been a police justice and was familiar with criminal laws, and he wanted me to look up the law on these points carefully for him and that they would call again. He then asked if it were possible for Miller to transfer his real estate, bonds and mortgages to his brother or wife, and if the sale could be made to protect Miller, I told him that under the circumstances it would be hard to prove a bona fide sale.

Next day or two they called again, the two Everests and Miller. They wanted to know if I had looked up the matter, and I told them I had. My advice was that

Miller, if he pursued that course, would lay himself open to serious criminal liability, and that all who took part in such a thing as advisors, or with guilty knowledge, were equally liable. I told them that if they pursued that course they would all get into State prison. Mr. H. B. Everest said that Miller was an honest man and wouldn't think of such a thing, but if he did do such a thing, they would have to find it out, or catch Miller before he (Everest) could be harmed. I advised him to have nothing to do with any such business."

Mr. Matthew's story of the case, as revealed on the witness stand, is briefly given below:

Mr. Matthews said he had been a manufacturer of oils since December, 1881. Before that he was engaged in farming in Wyoming county. He met Hiram B. Everest in 1873, and first saw John D. Archbold in the Vacuum office in Rochester some time during the summer of 1879. Ambrose McGregor he first saw the same autumn at the same place. He worked for the Everests at first, putting down test oil wells in Wyoming county. They struck salt. Then he went to Rochester and ran the *People's Journal* for the company for about four months. He also worked on their patent suits and told the Standard people that the patents were no good. They afterward sued him for infringing the same patents. He received \$50 a month during this time, but afterward his wages were raised to \$100. At a later date he went to New York and talked with the Standard people about the Wyoming county salt property. In 1881 he told Charles M. Everest that he and Miller were going into the oil business in Buffalo.

"As a man," said Everest, "I respect you, Mr. Matthews, but as to the Buffalo Oil Company I shall do what I can to injure and destroy it."

"I do not expect fairness from you," retorted Matthews.

"How then," said Everest, "are you going to get your crude oil?"

"From the Atlas."

"You may wake up some day and find the Atlas in the Standard."

I told him, testified Mr. Matthews, that I thought they would stick to the business. He said that they had ways of making money that I didn't know anything about. I had no further talk with Mr. Everest until December 9th, and, meanwhile, we had purchased two and one-half acres of land in Buffalo for the works. I had no knowledge of fitting out the works, but we depended on Miller. Before the transfer of the Vacuum stock to the Standard I had contracted to stay a year. I did not know Miller had copied the Vacuum patterns in Rochester, but I did know he was there a great deal of his time. At last I suspected the mice and put a spy on him. In June he disappeared, and then we watched for him at the depots, but could not get hold of him. His absence greatly retarded the construction of the works. On the day of the first run of oil I was not present, but I heard all about it when I arrived at the works the next day.

At the time Miller disappeared, I was President of the company, and he was Vice-President. He gave me no notice when he left. There was then no one who could make good oil. Only inferior oil was made under Superintendent J. Scott Wilson. We got a man named Kylie, but he was no good. Then we all turned in and experimented. When Miller left we had contracts which we were unable to fill. We only made 16,000 barrels the first six months, while the output should have been 300 or 400 barrels a day. The crude oil was

purchased from the Atlas up to January 1, 1882. I did not see Miller until the next August, when he was with a man named Taylor at the City Hotel. In September he came again with Lawyer Outerbridge to settle up. He demanded to see the books and said that he had come to offer his services. He said that he had been sick. I told him that we did not want him. They went away after looking over the stock book. A few days afterward they came again and I gave Miller a check for the amount that we owed him for his stock. I knew at the time that Outerbridge was related to Hiram Everest.

After this a suit was brought against us in the United States Court by the Vacuum Oil Company for infringing on patents. Judge Wallace decided that the patent was no good. The second suit was brought in the Monroe County Supreme Court at Rochester, and that went against them, too. The suits took up at least one-half of my time.

On cross-examination Matthews said he worked for the Vacuum Oil Company from 1878 till 1881, and that J. Scott Wilson was the first to suggest to him to leave that company and start the Lubricating Oil Company. Witness was questioned as to various alleged statements about preparing to squeeze the Standard Oil Company, making it come to his terms and buy him out, etc., but witness either denied making them or did not recollect. He did not in November or October say to Alfred B. Wright, of this city, that he would sell the works and withdraw all suits for \$350,000. He asked Wright to make a proposition and Wright said he had no authority to do so.

To the District Attorney the witness said that after the commencement of the first action he saw Mr. Rogers in New York. He went to see him about the patent litigations brought by the Vacuum Company against his company. He told him that they both knew that the product patent and the steam-introduction patent were without value. Mr. Rogers said that, nevertheless, they would carry the matter up from court to court until the Buffalo company got enough of it. The witness was shown the mutilated contract and asked to explain how it happened that the names of certain parties had been torn out. He said that Miller was anxious to see it, so he got it and allowed him to tear out his name. The witness afterward tore up the contract altogether, but finally concluded to paste together the fragments and keep them as a precautionary measure.

Colonel John Byrne, ex-Chief of Police of Buffalo, and at present head of a detective bureau, testified that in 1885 or 1886 he was employed by the defendants in the present trial, and that he received his instructions from Mr. S. C. T. Dodd, attorney for the Standard Oil Company. He engaged a man at work in the refinery to secure evidence as to how the Buffalo works run, the amount of oil they bought and consumed and who their customers were. He was also to learn who were connected with Matthews in the suits against the Standard, and if Miller had any promised interests in the proceeds recovered in these suits. Colonel Byrne reported to Mr. Dodd at New York and Mr. Outerbridge (Everest's counsel) at Rochester. He received pay for his services by check from Mr. Dodd.

John D. Rockefeller, President of the Standard Oil Company, testified: "I went to New York to reside ten or twelve years ago. My business is oil refining, and the works are located at Cleveland, O. I am not engaged anywhere else. I have known the Standard Oil Company since its original corporation, and was one of the

incorporators. It was incorporated in Ohio before 1870, probably twenty years ago, and has been incorporated I think in New York and Pennsylvania, and I think there is a Standard Company in Kentucky. I am President of the Standard Company of Ohio, but do not hold any office in any other company. The Standard Oil Trust Company is not incorporated. McGregor, Archbold and Rogers are shareholders of the Standard Trust. Our officers are a committee of Trustees. The Trustees are the custodians of stocks of refining companies in the United States, and possibly of small interests in other parts of the world. I am Chairman of the Board of Trustees. Among the Trustees in 1881 were Colonel O. H. Payne, of Cleveland, and Major C. G. Warden, of Philadelphia, and others I cannot recall."

He could not tell whether John D. Archbold was President of the Atlas Refining Works, at Buffalo, in 1882, and did not know when he did become President of the Atlas Company.

He could not say in how many companies the Standard Oil Trust holds stock. He never knew of any purchase of stock of the Vacuum Oil Company being recorded at the New York or Cleveland offices of the Standard Oil Company. He was unable to state whether or not the Vacuum Oil Company had made daily reports to the Standard Oil Trust. He could not state the number of shares in the Standard Oil Trust held by Archbold, Rogers and McGregor.

The defense attempted to show that the plaintiffs were the real conspirators who had attempted to blackmail the Standard Oil Company; that they conspired to obtain the secret processes used by the Vacuum Oil Company to infringe its patents and duplicate its works at Buffalo. Witnesses were called to prove that Miller went about boasting that he got \$40,000 as his share against the Vacuum Oil Company, and that Matthews tried, first through A. P. Wright, of Buffalo, then through Benjamin Brewster, Director of the Standard Oil Company, to sell the Buffalo works to the Standard Oil Company and withdraw his suit.

William O. Allison, the nominal editor of the *Oil, Paint and Drug Reporter*, testified that he once met Matthews in Buffalo, and that Matthews there offered to sell out the Buffalo works and drop all suits for \$300,000. He met him again at the Globe Hotel, Syracuse, ten days later, and there offered to sell for \$250,000, and said that he might submit these terms to the New York parties, whom he represented. A month later Matthews visited him at his home in Englewood, N. J., and there said if the money were paid he would cause the criminal suits to be *nolle prossed*. He also had other interviews with Matthews in regard to the sale. This witness admitted that he once edited and owned the *Oil, Paint and Drug Reporter*, and was the present owner of the *Painters' Magazine* and was a broker in oil stocks.

At the expiration of the twenty days' stay allowed by the court, the convicted parties, Hiram B. and Charles M. Everest, through their attorneys, filed their case and exceptions upon which a new trial is asked. They deny the jurisdiction of the court, claiming that no overt act charged was committed in Erie county. They except to Lawyer Truesdale being permitted to give away the secrets of his client, Miller. Generally they say there was no direct evidence of guilt, and the prisoners should have been discharged by the court. The document contains 450 pages of condensed evidence. The answer must be served by the people before the 21st of June.

THE PATENT SUITS.

The Vacuum Oil Company instituted several suits

against the Buffalo Lubricating Company, in all of which it met defeat. At the general term of the Supreme Court, at Rochester, in April last, a decision was handed down affirming the judgment of the lower court. This action was brought four years ago by the Rochester company, which is declared to be a branch of the Standard Oil Company, for an alleged infringement of a trade mark. This consisted in the use of the words "made by vacuum process" on the printed labels used on the harness oil cans sent out by the Buffalo Lubricating Company. The testimony was taken and the case referred to Judge Peck, of Genesee county, who reported a judgment against the Vacuum company with costs. This judgment is now affirmed by the general term. The Buffalo company then claimed that this, like previous suits against it, on five patents, was brought in pursuance of a conspiracy to destroy its business.

Recent Publications.

PRELIMINARY REPORT ON PETROLEUM AND INFLAMMABLE GAS IN OHIO. By Edward Orton, State Geologist. Reprinted for the author with a Supplement.

The original edition of the Preliminary Report was published by order of the Legislature of Ohio, in June, 1886, and distributed by the members of the Legislature. No copies were placed on sale, and the present edition, which contains the preliminary report entire, with a supplement, giving the more recent facts in the new fields, is issued to meet the general demand that has sprung up for the work. Prof. Orton possesses in a marked degree the faculty of presenting scientific conclusions, freed from unfamiliar terms, and in a way that is very satisfying to the unscientific reader. A geological map accompanies the work, showing the gas fields of the State as at present developed, and a portion of the book is devoted to the gas fields of Indiana. Prof. Orton points out the conditions under which gas and oil are found in the Trenton rock, the districts in which those conditions are most likely to exist, and the reasons for success or failure in particular instances. He also describes the most practical methods of measuring the flow of gas wells. The work is a timely one and should be in the hands of every person who is in any way interested in the great development of oil and gas that has just started on such an unheard of scale in the West.

Railroad Rates for Shipping Bradford Oil.

The Buffalo, Rochester & Pittsburg railroad have put in a switch between Bradford and DeGoliery, and along side of this switch Senator Emery has erected a loading rack. The Senator failed to take care of the Billingsley bill, but he is landing oil direct from his wells on the East Branch at the refinery of Logan, Emery & Weaver, in Philadelphia, independent of Standard seaboard pipe lines. The rate for shipping oil from Bradford to Philadelphia via B. R. & P. R. R. and P. & E. R. R. is 45 cents per barrel in car-load lots. The rate from Bradford to Buffalo is 20 cents per barrel. Refined in barrels is shipped to Perth Amboy and Communipaw for 52 cents per barrel. The New York, Lake Erie & Western R. R. have published the following rates for shipping refined and crude oil in car-load lots: From Bradford and Kendall to New York and all stations on the road east of Susquehanna and to Philadelphia, 52 cents per barrel. The rate to Albany, Troy and Schenectady and intermediate stations on the D. & H. C. R. R. between Binghamton and Albany, 48 cents; Boston and New England and points taking Boston rates, 78 cents. The rate to Buffalo will be 20 cents per barrel.

THE PRODUCING REGION.

At the beginning of May there were 79 new rigs and 158 drilling wells in the New York and Pennsylvania oil region, a total of 237. The number of wells completed in May was 146, with an estimated new production of 3182 barrels. The dry holes numbered 36, leaving 110 productive wells, with an average yield of 29 barrels. In April there were 126 productive wells finished, which averaged 49 barrels each, and the dry holes were 43 in number. During March the entire region completed 89 productive wells and 44 dry holes, and the average of the new wells was $42\frac{1}{2}$ barrels. The average of the February wells was $65\frac{1}{2}$ barrels, of the January 30, of the December 30, of the November 31, of the October 30, of the September 62, and of the August 48 barrels. The May figures show a decrease of 23 wells and of 3056 barrels new production, while April recorded an increase of 36 wells and of 2451 barrels in the new production. At the close of May there were 81 new rigs, 107 old rigs and 161 drilling wells in the entire region, a total of 349, as compared with 79 new rigs, 119 old rigs and 158 drilling wells, a total of 356 at the close of April. This is an increase of 2 new rigs and 3 drilling wells, and a decrease of 12 old rigs from the figures of April 30. April had a decrease of 9 in rigs and drilling wells from the March report, while March showed an increase of 7 in active operations over February, February a decrease of 40 from the January report, January a decrease of 48 from December and December of 95 from the November figures. At the close of May, 1886, the record showed 186 new rigs, 137 old rigs and 407 drilling wells, a total of 730. In May, 1886, 351 wells were completed, with 57 dry holes, and the new production was 11,588 barrels. The field as a whole is very quiet. Desirable territory was never more difficult to find and the inactive state of the crude market renders a shut down of active work in the old sections almost compulsory. Washington is fast pursuing the course of the older fields, and the southwest extension of Reibold is almost completely hedged in with dry holes. Taylorstown bids fair to add some fresh territory to the producing area, but it will not be developed with haste, so long as nothing better than present results are obtained and the crude market remains in the lower sixties. Elk county has attracted some attention, but the wells thus far discovered are as small proportionately as they are deep, and operators are not very hasty about urging the drill.

ALLEGANY FIELD.

The Allegany field completed but two wells in May with a new production of 8 barrels. A gas well drilled near Shingle House, in Potter county, is the single dry hole included in the monthly report. April completed 3 wells and March 8. New operations at the close of the month are confined to 2 rigs and 5 drilling wells, while 33 old rigs are still standing in various parts of the field. Nothing of an experimental nature is now under way in this field.

THE BRADFORD FIELD.

Fifteen new wells is Bradford's record for May, one of which was a fair gasser and another a total failure. The 13 productive wells had a total yield of 86 barrels. Sixteen wells were completed in April and 9 in March. The Manufacturers' Gas Company, of Bradford, succeeded in finding another gas producer on the Mack lands. An effort by some local parties to extend the Cole Creek section westward toward Farmers' Valley resulted in failure. At the close of May there were 11 new rigs and 16 drilling wells in the Bradford field, as compared with 8 new rigs and 16 drilling wells at the close of April.

WARREN AND FOREST.

There were 64 new wells completed in the Middle field in May, including 11 dusters, and the new production was 721 barrels. This is an increase of 12 wells and of 349 barrels production, as compared with the figures for April. On the last day of the month the field showed 32 new rigs, 19 old rigs and 41 drilling wells, against 27 new rigs, 21 old rigs and 41 drilling wells on the last day of April.

KINZUA VILLAGE.—Odell, Smith & Co.'s No. 2, on the J. R. Johnson tract, 400 feet west of No. 1, is rated at 150 barrels a day. Collins & McCalmont Oil Company's No. 10, White, is of the same calibre. A peculiarity of this development the past month was the discovery of a brace of dry holes, between the good producers on the White tract and the well on the Hodge. White, No. 9, was a total failure, and Smith, Bright & Co.'s No. 9, directly southwest, was also a duster; their No. 8, rated at a small well last month has been abandoned. But for the goods wells south and west of these three dry holes they would be deemed sufficient to condemn all theories of further extension in this direction. The Columbia Oil Company's venture on the eastern part of warrant 5554, marks another dusty sentinel for the western edge of the pool. Fogel & Son completed a dry hole on the Jamieson lands, southwest of Dew Drop, in the direction of Clarendon.

Clarendon and Tiona reveal the usual number of five-barrel wells. Present drilling is confined to defined territory and little of an experimental nature is under way. Horton, Crary & Co. have a well drilling below Sheffield, on lot 319, which is a test of some importance. James Welsh is the only party busy in the Balltown field, and he continues to find small producers on the outlying edge of this once famous pool. A single well is starting in the Cooper section. Nothing of any moment is in progress at Kane. J. Stettheimer is drilling one well on the Andrews lease, lot 14, warrant 3775.

GRAND VALLEY.—Grand Valley is the only really stirring section of the Middle field, and even here the activity is not marked. Nineteen wells is the record for May, including 3 dry holes, against 17 in April with 4 dusters. The Reno Oil Company found another failure in the northern part of the field. Emery & Ralston's venture, on lot 135, which has been shut down since last fall, was found to be worthless when drilled through the sand. Coldren & Matson also completed a dry hole on the Sutliff farm, near Enterprise. S. P. Robinson's second venture, in the same locality, is rated as a three-barrel well. Some fair wells have been found along the Spring Creek road, west of Grand Valley, and a vigorous demand has sprung up for old territory in the region about Enterprise, Pleasantville and Shamburg.

ELK COUNTY, ETC.—There is little change in the situation of affairs in the "big woods" southwest of Kane. Murphy, Taylor & Torrey's mystery, in the southeast corner of 2027, has been opened since the first of the month and reported as a six or eight barrel pumper. It adds a considerable stretch of fresh territory to the northeast, and shows that none of it is destined to be of very large proportions. Six wells were completed in May which are rated at 10 to 15 barrels each. By drilling a long distance apart the wells are hoped to eventually pay out. The best wells thus far found are located on warrant 2033.

The Wilcox Tannery Company succeeded in finding a good 10-barrel producer in the southeast corner of warrant 2676, McKean county. It is located about six miles east of Kane and in the midst of the territory from

which Buffalo, Bradford and other towns secure their supplies of natural gas. The well gauged 35 barrels the first twenty-four hours, and on the third day had declined to 15 barrels.

The Chandlers Valley Oil Company found a small showing of oil at their venture near Duprez Mills, in Sugar Grove township. It was drilled to a depth of 1800 feet, and shot at 850 feet. It has produced enough oil to excite the farmers in the vicinity with vigorous ideas of the future, but is rated as a worthless venture in the list of completed wells.

Colonel John J. Carter completed a three-barrel well on the McIntyre farm, along the edge of his extensive purchase in the West Hickory fields.

Taylor, Torrey & Murphy have drilled two dry holes on the Dawson lands, along Stewart's run, west of the Allegheny river, in Forest county, and Messrs. Shannon, Kelley & Co. are preparing to make another test on their large lease in Greene township.

THE LOWER COUNTRY.

There were 64 wells completed in the Lower country in May, 22 of which failed to find oil; the new production is 2,367 barrels a decrease of 34 wells and of 2384 barrels production from the April figures. On the 31st of May the Lower country had 36 new rigs, 31 old rigs and 99 drilling wells, as compared with 41 new rigs, 38 old rigs and 97 drilling wells on the 30th of April.

VENANGO.—Venango county shows a general decline in activity along the petroleum frontier. Nineteen productive wells and 7 dry holes is the story for May. The best wells of the month were found in the old Shamburg pool, and along the flooded edges of the old Oil Creek district. New work is widely scattered and no territory now in sight offers any great inducement for the drill. Venango records 15 new rigs and 17 drilling wells at the close of May, against 18 new rigs and 20 drilling wells at the close of April.

CLARION.—Interest in the new development two miles south of Reidsburg and seven miles south of Clarion, subsided with the downward course of the drill in the month of May. Drilling thus far surrounds the pioneer well, on the Kifer farm, with an appalling loneliness. Hess, Sackett & Co.'s venture, on the Shiry farm, 400 feet west of the well on the Kifer, was dry in all sands. Hon. M. L. Lockwood & Co. secured a duster on the McElravy farm, about one-third of a mile southeast of the Kifer. The sand at this well had thickened to 28 feet, but it was barren of oil. Stewart & Co.'s test, situated midway between the Kifer and the Lockwood wells, was the third dry hole placed on the list in this section since oil was struck in the shallow sand of the Kifer. The three wells completed last month were all drilled to the Clarion third sand. The oil from the Kifer well in its crude state stands a fire test above 110° as it comes from the well and is said to afford as brilliant a light as the refined oil sold in Clarion county. It is pronounced safe by the district inspector, and Mr. Hess will sell it for illuminating purposes as it comes from the well.

BUTLER AND ARMSTRONG.

From the mouth of Breakneck creek, stretching in a southeasterly direction along the Pittsburgh & Western Railroad into Allegheny county seven dry holes were drilled in the month of May with the hope of finding an extension to the Reibold pool. There are gaps a mile in width between these dusty guide posts, but the chances are that the Reibold streak will terminate before the main line of the Pittsburgh & Western Railroad is reached. Gibson, Gahagen & Lenz had a showing of

oil at their well in the Reibold sand at the mouth of Breakneck creek. The sand, however, was of inferior quality. Phillips & Osborne's well, on the George Marburger farm, about one mile south of Evans City, did not have a regular body of sand. Where the rock should have been there was a sort of skeleton with the filling between the upper and lower crusts made up of shells. There was a black scum on the warm water in which the sand pumpings were washed. Phillips & Osborne's well, on the May farm, east and north of their venture on the Marburger, was dry in the fourth sand and is being drilled below the level of the Bradford horizon. M. P. Black & Co.'s venture, on the Staples farm, west of Callery Junction, made a showing of gas and oil in the 100-foot, but is a failure for producing purposes from the Reibold rock. Westerman, Reep & Co.'s well, on the Kline farm, S. W. Harley & Co.'s well, on the McClintock farm, and the Preston & Huff well, all south of the belt range of the Reibold pool, were dry. Butler county still presents an alluring field to the wildcatter and the usual number of test wells is still under way in various parts of the county. Southwest of the Reibold development, in Cranberry township, Phillips & Osborne are drilling two wildcat wells.

GREENE COUNTY.

E. M. Hukill & Co. are drilling the Mount Morris well below the level where the deep sands of the Washington field should be found. While this work goes on the well continues to flow, but the owners refuse to state just how much it is producing. Johnston & Hamilton have been obliged to move the rig at their Ninevah well on account of a plugged hole. The casing has been removed from the Forest Oil Company's well at Bristoria, and drilling is progressing slowly through a huge volume of salt water which was struck at 1310 feet. Mr. E. M. Hukill has the Mount Morris country all to himself and should not be obliged to pay heavy rentals while testing such a broad range of territory.

SHANNOPIN.

The Solar Oil Company and the Raccoon Oil Company's No. 25, on the Morrow farm, about eighty rods southwest of No. 21, the banner well of the field, is a failure, and the rig will be removed to some other location in the field. No. 24, which was finished in May, made a good start, but is not producing at the present time on account of a fishing job. There is but little doing in the Shannopin field and operations are quiet.

WASHINGTON.

The old Washington field has settled down to a steady going producing area, and each succeeding month it presents fewer features of interest. Since our last review of the district was penciled an oil well has been completed where a gasser was expected. John McKeown located a well about 120 rods northeast of his No. 7, along the northwestern line of the Munce farm, on what was supposed to be sure gas territory, and struck a well which started at 200 barrels per day. The small amount of drilling in the old field is found southwest of the Davis, No. 7, and further to the northeast about the Fergus farm.

The Forest Oil Company & J. W. Craig's well, on the S. Woodburn farm, came up to the expectations of the oil men who are given to theorizing on the Taylorstown development. It was located southwest of a gas well which sprayed oil, and according to many precedents in the field, was to be a good well. It started at 225 barrels, and on Saturday, June 4th, it gauged above 200 barrels. It widens the streak, whose greatest length at the present time is in a northeasterly and southwesterly direction.

Below is a list showing the production of wells by groups on the different farms which make up the total of the Washington field for May 7 and June 11, 1887:

Farm.	Operator.	Number of wells, May 7.	Production May 7, Bbls.	Number of wells, June 11.	Production June 11, Bbls.
Gordon, P. L. & H. Co.		4	68	5	164
Hess, "		3	13	3	13
Weirich, Forest Oil Co.		2	25	2	82
Hall, "		4	50	4	56
Barre, "		13	831	13	755
Taylor, Union Oil Co.		7	238	7	238
Morgan, "		8	303	8	237
Davis, "		6	850	6	409
Dye, "		1	30	1	28
Workman, "		2	300	2	157
McGovern, "		1	25	1	24
Clark, "		1	3	1	2
Zelt & Martin, Associated Producers Co.		2	4	2	11
Wiley, "		1	8	1	6
Curry, "		1	12	1	10
Gantz, Citizens' Oil & Gas Co.		1	12	1	15
Weaver, "		1	7	1	7
Clark, Hallam & Co.		1	7	1	5
Taylor, Galligan & Young.		2	33	2	53
Clark, R. H. Thayer & Co.		6	179	6	137
Munce, John McKeown.		13	440	14	445
Martin, "		4	550	4	550
Quail, "		1	10	1	5
Smith, Willets & Young & Chartiers O Co		6	163	6	99
Cameron, "		9	452	9	395
Wright, Chartiers O Co & F W Andrews.		3	149	3	108
Fergus, Chartiers Oil Co.		2	306	2	259
Stewart, Fisher Oil Co.		1	44	1	24
Lead Lot, Marsh & Caldwell.		1	25	1	12
" McKeever & Mulholland.		1	12	1	8
Fair Grounds, Wheeling Oil Co.		3	64	3	56
Cradle Factory Lot, Miller.		1	53	2	43
Hall Lot, Guffey & Co.		1	5	1	5
Linn, Coast & Co.		3	79	3	57
Weirich, "		1	13	1	12
Hayes, "		1	7	1	7
Shirls, Shirls.		3	44	3	30
Manifold, Pew & Emerson.		2	62	2	60
Gabby, "		1	5	1	5
Martin, Central Oil Co.		3	163	3	115
McGahey, Mascot Oil Co.		4	100	4	119
Miller, (Bunghole well), Reid & Co.		1	1	1	1
Montgomery, McKinney & Co. & Robbins.		2	19	2	11
Thome, Chartiers Oil Co & F W Andrews.		1	5	1	5
Wade, B. B. Campbell.		1	935	3	518
Weaver, Hart Bros.		1	15	1	12
Thome, Lee & Shank.		2	48	2	50
Wiley, Munhall & Co.		2	11	2	8
McKean, Caldwell & Co.		1	17	1	12
Van Kirk, "		1	5	1	4
Whittlesee, "		1	105	1	185
Watson, Butler & Co.		2	23	2	10
Martin, Allen & Co.		1	12	1	16
Munce, I Willets & Son.		24	704	23	645
Montgomery, Montgomery & Co.		1	15	1	10
McNary, Craig & Co.		1	15	1	4
Welsh, Reed & Co.		1	1	1	90
Happer, Happer & Co.		1	1	1	10

TAYLORSTOWN.

McMannis, W Va Nat Gas Co.	1	60	1	55
Noble, "	1	175	1	170
Blayne, Hart Bros & Co.	1	162	2	227
Cundall, Vandergrift, Reed & Aiken.	1	146	1	140
McMannis, J M Guffey & Co.	1	1	1	100
Woodburne, F O Co & Craig.	1	1	1	216

Total180 8228 187 7361

Date.	No. of wells.	Production Barrels.
May 7, 1887.....	180	8228
June 11, 1887.....	187	7361
Difference.....	7	867

The Refined Market.

The refined trade has averaged well for the dull season of the year, and the demand has answered most expectations. The price for 70° Abel test remained steady at 6¾c until the 13th, when it was marked down to 6½c, and continued thus without any changes for the remainder of the month. Small lots of western oil have been reported as offered at 6½c, and some shippers insist that there should be a general reduction to this figure. Freight rates for the continental ports have ruled low and the room is often in excess of the requirements. The foreign buyer is determined to carry no more stocks than he can possibly help, and the excess of manufactured oil has to be cared for at the home refineries.

The exports of refined, crude and naphtha, from all ports, from January 1 to June 4 have been as follows:

	1887. Gallons.	1886. Gallons.
From Boston.....	1,962,080	2,290,729
Philadelphia.....	61,746,401	54,947,018
Baltimore.....	3,005,106	5,111,161
Perth Amboy.....	7,093,938	1,593,770
Total.....	73,808,525	63,942,678
From New York.....	151,131,705	161,671,357

Total exports from United States...224,940,230 225,614,035

Refined for the home trade is in small demand, and prices are somewhat irregular. Western lots are freely offered a shade below regular quotations, which are about as follow: 8@8½c for New York State legal test, 7@7¼c for 110° test, 8@8¼c for New York city 110° flash, and 8½@9c for New York city 150° water white. Western lots are offered at 6¾@7c for 110° test Standard white, 7¼@7½c for 120° test Standard white, 7½@7¾c for 130° test Standard white, and 8¼@8½c for 150° test water white. Western naphtha 68° to 72° test is quoted at 7½@8c delivered in New York.

Refined in cases continues in good demand on a basis of 8½c for plain tops. The clearances for May in this class of goods to China and the East amounts to 949,574 cases, a decrease of 162,948 cases from the same month in 1886. The total clearances to May 31, 1887, are 4,517,607 cases, a decrease of 1,695,523 cases, as compared with the corresponding period of the year preceding.

Mr. George H. Lincoln's monthly circular gives the following figures on the clearances of refined petroleum, in cases, for China and the East up to the 31st of May, for the years 1886 and 1887:

	1887. Cases.	1886. Cases.
China.....	825,552	2,020,852
Japan.....	1,150,839	879,917
India.....	1,497,305	1,719,284
Java, Singapore, etc.	1,043,911	1,593,087
Total May 31st.....	4,517,607	6,213,130
Total April 30th.....	3,568,033	5,100,608
Clearances for May.....	949,574	1,112,522
Clearances for April.....	1,085,363	742,478
Clearances for March.....	1,157,823	2,058,609
Clearances for February.....	733,626	1,281,488
Clearances for January.....	591,221	1,018,033
Total.....	4,517,607	6,213,130

REFINED QUOTATIONS FOR MAY.

	New York	Philadelphia	Baltimore	London and Liverpool	Bremen	Antwerp
	Cts.	Cts.	Cts.	Pence.	Marks.	Francs
1.....	6¾	6¾	6¾	5½	5.95	15½
2.....	6¾	6¾	6¾	5½	5.95	15½
3.....	6¾	6¾	6¾	5½	6.00	15½
4.....	6¾	6¾	6¾	5½	5.95	15
5.....	6¾	6¾	6¾	5½	5.95	15
6.....	6¾	6¾	6¾	5½	5.95	15
7.....	6¾	6¾	6¾	5½	5.95	15
8.....	6¾	6¾	6¾	5½	5.95	15
9.....	6¾	6¾	6¾	5½	5.95	15
10.....	6¾	6¾	6¾	5½	5.95	15
11.....	6¾	6¾	6¾	5½	5.95	15
12.....	6¾	6¾	6¾	5½	5.95	15
13.....	6¾	6¾	6¾	5½	5.95	15
14.....	6¾	6¾	6¾	5½	5.95	15
15.....	6¾	6¾	6¾	5½	5.95	15
16.....	6¾	6¾	6¾	5½	5.95	15
17.....	6¾	6¾	6¾	5½	5.90	15
18.....	6¾	6¾	6¾	5½	5.90	15
19.....	6¾	6¾	6¾	5½	5.90	15
20.....	6¾	6¾	6¾	5½	5.90	15
21.....	6¾	6¾	6¾	5½	5.90	15
22.....	6¾	6¾	6¾	5½	5.90	15
23.....	6¾	6¾	6¾	5½	5.90	15
24.....	6¾	6¾	6¾	5½	5.90	15
25.....	6¾	6¾	6¾	5½	5.95	15
26.....	6¾	6¾	6¾	5½	5.95	15
27.....	6¾	6¾	6¾	5½	6.00	15
28.....	6¾	6¾	6¾	5½	6.00	15
29.....	6¾	6¾	6¾	5½	6.00	15
30.....	6¾	6¾	6¾	5½	6.00	15
31.....	6¾	6¾	6¾	5½	6.00	15

"OUR women don't have to split wood" is a motto of the Findlay gas jubilee.

NATURAL GAS IN SOUTHEASTERN OHIO.

F. W. MINSHALL.

The advantages attending the use of natural gas as fuel for household use and for manufacturing purposes have caused the search for it to be prosecuted with great energy and persistence in many quarters. The last two years' operations have disclosed the fact that Marietta is the only town in Southeastern Ohio which is known to have an abundant supply of natural gas within easy piping distance. Ironton, Pomeroy, Logan, Lancaster, Newark, Dresden, Zanesville, Coshocton, Canal Dover, Kimbolton, Quaker City and Cambridge have each drilled from one to three wells in vain search for the hidden treasure, while from Marietta, in three different directions, the fitful glare of the burning gas may be seen lighting the heavens.

The Macksburg oil field, which is twenty miles from Marietta, has, along its northwestern border, a strip of gas territory covering several square miles. On this strip there are several wells from which the gas has been flowing in large quantities for several years. From the "Minshall" well, on the Matthew Mitchell farm, and the Gilmore & Porter wells, on the John Kellar farm, at least five millions of cubic feet per day have been going to waste. The quantity of gas in this strip of territory has caused parties to consider the feasibility of carrying it to Zanesville, a distance more than double that to Marietta.

The southwestern end of the Liberty township anticlinal is within eleven miles of Marietta. On this arch is located the "Epler" well, drilled by the Bradish Oil Company, of Parkersburg. The well is about one mile from the Burning Spring, on Mill Fork, of Fifteen Mile creek, one of the natural curiosities of the region to the "oldest inhabitant." The gas was struck at a depth of 1700 feet in the "Berea" or Lower Macksburg sandstone. The measured flow of the well was three millions of cubic feet per day, and the closed pressure over 300 pounds per square inch in one and a quarter minutes. There are about four square miles of territory on the crest of this arch which have had no test except as shown by this well.

Near Eureka Station, on the Ohio River Railway, the line of the great White Oak anticlinal crosses the Ohio river. On the southwestern end of this arch, at Burning Springs, in Wirt county, W. Va., very large quantities of high-pressure gas were found twenty years ago. A well lately drilled on the northeastern end, near Eureka Station, and not far from the mouth of French creek, known as the Johnson well, is flowing probably two millions of cubic feet per day. This well is about eleven miles from Marietta.

The combined production of the wells above named is ten millions of cubic feet per day, of which no use whatever is being made. Professor Orton, in his preliminary report on petroleum and gas, estimates 1000 cubic feet per day, at the well, as sufficient to supply an ordinary household fire. On this basis there is now going to waste near Marietta sufficient fuel to keep 10,000 fires daily burning. Wheeling and Bellaire reach out 35 miles, Youngstown 40 miles, Buffalo 80 miles, to grasp the coveted fuel which yields them health, wealth and physical comfort, while Marietta sleeps on unmindful of her rare opportunity.

The wells above named were not drilled for gas, the large supply having been obtained incidentally in drilling for oil and the territory where they are situated has been considered comparatively valueless, because it con-

tained gas instead of oil. Another important feature is the fact that the wells above named represents three separate and distinct fields, two of them within 11 miles and the third within 20 miles of Marietta. The 15 mile field also lies about half way between the Macksburg field and Marietta, so that a line could be first laid to the 15 mile field, and afterwards, if necessary, be extended to the Macksburg field as the demand for consumption increased.

The foregoing facts would seem to warrant the assumption that the question of supply is already settled beyond a reasonable doubt, but, if the considerable amount of capital required for the plant should cause hesitation, a small amount of money judiciously expended in testing the three fields above named would surely double the present supply and place the daily flow far beyond Marietta's demand for consumption.—*Marietta Leader.*

Gas Aids the Growth of Trees.

It has been demonstrated that a burning gas well in the vicinity of an orchard kills insects and makes the growth of trees more healthy. One of the Philadelphia company's wells is located in a big orchard near Murphysville, which has been completely ridden of insects of all kinds. The unwary little destroyer flew to the gas flames in millions and their carcasses covered the ground for several rods around the well. At Economy, where a hundred or more stand pipes for natural gas have been erected to illuminate the streets, the bugs and fruit tree vermin were slaughtered wholesale. In the mornings after the gas was lighted first there would be a fine carpet of bugs around every post. The chickens and turkeys would have a feast every morning, and a foot race from the roosts to see which would get to the all ready cooked breakfast first. The trees in this fertile locality came out in bloom much earlier and healthier this spring than formerly, partly on account of the vermin being destroyed and partly from the fact that the frosts were kept from settling by the gas lights, which burn constantly. It was noticeable, too, that trees nearest the lights blossomed several days sooner than those some distance away.

SUMMARY of the Statements of the National Transit Company for May and April:

	May. Barrels.	April. Barrels.
Receipts from all sources.....	1,767,448.13	1,665,810.51
Deliveries.....	2,065,913.79	1,657,057.03
Gross stocks end of month.....	32,889,159.25	32,952,525.44
Sediment and surplus.....	4,043,054.03	3,803,145.35
Total liabilities end of month.....	28,846,105.22	29,149,380.09
Outstanding acceptance.....	22,091,036.33	22,428,036.33
Credit balances.....	6,755,068.89	6,721,343.76

The above "receipts from all sources" for May were made up as follows:

Runs from wells.....	1,376,834.96
Received from other lines.....	390,613.17
Received in iron tanks.....	

Total.....1,767,448.13

The above "total deliveries" for May were made up as follows:

Regular shipments.....	1,880,588.58
Delivered to other lines.....	185,325.21

Total.....2,065,913.79

The above "receipts from all sources" for April were made up as follows:

Runs from wells.....	1,345,877.49
Received from other lines.....	319,933.02

Total.....1,665,810.51

The above "total deliveries" for April were made up as follows:

Regular shipments.....	1,601,351.25
Delivered to other lines.....	55,705.78

Total.....1,657,057.03

MAY OPERATIONS.

THE ENTIRE REGION—WELLS COMPLETED, WELLS DRILLING, AND RIGS UP AND BUILDING.

WELLS COMPLETED IN MAY, 1887.

Allegheny Field.

Twp.	Owner.	Barrels.
Scio, 46, L G Norton No 2		5
Bolivar, 23, (Ketchum) Stewart & McDonald		3

Miscellaneous.

Shingle House, Mutual Gas Co (for gas)	gas
Wells completed	3
Production	8
Dry	1

Bradford Field.

East and West Branches.

Mack, Manufacturers' Gas Co No 5	gas
Hatfield, Wood & Young No 5	3
Cutting, Booth, Hensler & Co No 2	6

Kendall Creek.

Melvyn, P C L & P Co No 93	6
" " No 94	6
" " No 95	6

Knapp's Creek.

Duke, J West No 7	6
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Four-Mile.

Stevens, Stevens Bros No 2	8
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Indian Creek.

H Loop, Franchot Bros	5
Gale, G N Moore No 12	8
" Borden, Cook & Dodd No 1	6

Cole Creek.

Bingham, lot 588, Associated Producers	No 66
Farmers' Valley, Smith & Boyer	dry

Kinzua.

Guffy & Hulings, Union Oil Co	No 71
Lot 6, Riterville, John J Carter	No 20

Wells completed	15
Production	86
Dry	2

Warren and Forest.

GLADE AND OTHER TOWNS.

Kinzua Village.

Hodge, Morse & Collins No 2	10
White, " No 10	150
" " No 11	20
Johnson, Sill, Odell & Smith No 2	150
Willie Run, Smith, Bright & Co No 9	dry
5554, Columbia Oil Co	dry
Sugar Run, Leonhart & Co	5
English, H E Brown	dry

Warren.

Rankin, McWilliams Bros	5
Clark, Cogswell & Co No 4	5
Irvine, Brown Bros No 9	5

Wells completed	12
Production	350
Dry	4

Clarendon.

35, (Willie) Hazeltine & Bell No 4	5
35, Henderson & Murphy	5
35, J Smith & Son No 9	6
497, D. Riddlesperger	5
463, Ed O'Donnell No 3	4
108, Hackett & Shirley No 7	5
104, O'Donnell & Hill No 4	5
107, Mitchell & Boggs No 2	4
107, W B Roberts & Son	5
531, S Short & Son	5
532, C A & D Cornen No 1	5
562, Goal Bros No 4	4

Wells completed	12
Production	58
Dry	0

Tiona.

165, Wm Helm & Co	5
82, (lot 20) J L McKinney & Co	6
82, (lot 8) "	5
200, (Hague) Wesley Chambers No 6	5
240, (Tidewater) Carter & Thompson No 9	6
244, Horton, Cray & Co No 25	6

Wells completed	6
Production	33
Dry	0

Balltown.

Green, James C Welsh No 3	10
Proper Reserve, Proper Reserve Oil Co	10

Wells completed	2
Production	20
Dry	0

Kane.

343, Basswood Oil Co	gas
343, Ernhart & Co	6

Wells completed	2
Production	6
Dry	1

Grand Valley.

Blakeslee, Miller & Crippens No 10	25
" " No 11	20
Ellis, Reno Oil Co	gas
Campbell, National Oil Co No 15	10
" " No 20	20
" " No 21	10
Hunter, " No 14	10
Knapp, L B Wood & Co No 2	15
Wales, (151) " No 7	5
Huidekoper, " No 2	5
" " No 3	5

Breen, John Breen No 5	5
Anderson, Brown Bros	5
Proper, Bovee & Duck No 1	8
" " No 2	10
Lot 135, Emery & Ralston	dry
" 142, Holman & Hopkins No 4	8
Enterprise, (lot 54) S P Robinson No 2	3
Sutliff, Coldren & Co	dry

Wells completed	19
Production	164
Dry	3

Miscellaneous—Elk County, Etc.

2033, Porter, Thyng & Co No 4	15
2033, " No 6	15
2033, Highland Oil Co No 1	15
2033, Clark & Foster No 3	12
3663, " "	5
3663, Boyer, Simpson & Co No 3	15
2676, (McKean) Wilcox Tannery Co	10
Climax, (Jefferson Co) Ellis & Co	dry

Warren and Forest Counties.

Sugar Grove twp, Chandlers Valley Oil Co	dry
McIntyre, John J Carter No 3	dry
Dawson, Taylor, Torrey & Co No 1	dry

Wells completed	11
Production	90
Dry	3

Lower Country.

Venango and Other Sections.

Farm.	Operator.	Barrels.
Kaufman, A P Dale No 9		8
Button, J B Smithman		6
Main, W J Robinson		3
Columbia, Columbia Oil Co No 173		15
Foster, Dr Foster		dry
Pearson, Moyer Bros		3
Sunville, (Grove) Phillips Bros		dry

Vicinity Pleasantville.

Shamburg, (Atkinson) W P Black	15
Folwell, W P Black	4
Cecil, Culp & Stewart No 1	5

Tipperary, Hall's Run, Etc.

Siggins, Taylor, Torrey & Murphy No 11	8
Big Meadow, Huff, Reidey & Osborne	3
McCalmont, S P McCalmont	2
Saddler, Wolf & Kugler No 2	dry
Sleppy, Judd & Geiser	4
Church lot, Deitrich & Warfield No 2	dry
Toberer, Gailey, Roe & McBride	dry
East Sandy, (Lynn) John Lee & Co	gas

Tarkill.

J S McCalmont, Canning & Goettel No 10	12
Thompson, Clark & Foster	6

Rockland or Red Valley.

Bishop, Burton & Co	gas
Wicks, W H H Piper No 14	10

Vicinity Emlenton.

W P Grant, Edwards & Co	3
Byrom Centre, (Phil lands) Sam Phillips	8

Bullion.

Crawford, Hoffman & Co	8
Dougherty, Hovis & Co	15
Wells completed	26
Production	138
Dry	7

Clarion.

Hess, Hess & Sackett	25
McDowell, Amsler Bros	5
Smith, Smith & Wagner No 2	dry
Stover, Stover & Co	dry
John Thompson, Johnson & Buzzard	dry
McElravy, M L Lockwood & Co	dry
Shiry, Arnold, Stewart & Co	dry
Shiry, Hess, Sackett & Co	dry
Edmund's heirs, Urquhart & Lavens	No 11
Pollock, Gailey Bros & Grant	dry

Wells completed	10
Production	45
Dry	7

Butler and Armstrong.

J Kline, Westerman & Co	dry
Houghton, Forquer Bros No 2	10
Stefin, T W Phillips & D Osborne	25
Gelbech, " No 3	800
John Staples, M P Black & Co	dry
Behm, Burchfield & Co No 2 est.	500
Ash, Gibson, Gahagen & Lenz	dry
Chas Dunley, McBride & Campbell No 5	35
McElroy, Meldrum Bros & Co	dry
McCandless, Reiber & Campbell (for gas)	dry
G Reiber, G Reiber & Co	gas
May, Phillips & Osborne	dry
McClintock, S W Harley & Co	dry
Gibsonia, Preston & Huff	dry

Martinsburg.

Fletcher heirs, S W McKee No 2	15
" " No 3	15

Thorn Creek.

Maharg, Bolard & Thompson No 3	15
Burton, Russell & Greenlee No 1	20
" Collins & Reeder	12
Klinger, Iman, Waldron & Co No 3	12
Barton, Shaffer Bros & Co No 2	20

Wells completed	19
Production	1479
Dry	7

Washington.

Barre, Forest Oil Co No 13	80
W J Munce, John McKown No 14 est.	40
" " No 15	16
Cradle Factory lot, Miller & Co No 2	20
Happer, A G Happer No 1	15

Taylorstown.

McMannis, Robbins & Guffey	140
Woodburne, Forest Oil Co & Craig est.	200
Ebenezer Davis, Wheeling Natural Gas Co No 1	gas
McGraw Run, Wheeling Gas & Oil Co	dry

Wells completed	8
Production	505
Dry	1

Shannopin.

A P Morrow, Raccoon Oil Co & Solar Oil Co No 24	200
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Wells completed	1
Production	200
Dry	0

DRILLING WELLS.

RIGS UP AND BUILDING MAY 31, 1887.

Allegheny Field.

Scio.

Lot.	Owner.	Depth.
3, Coyle & Simon (old)		rig
12, Allen & Morse (old)		rig
12, Griffin & Co No 10 (old)		rig
50, Pease & Coyle No 9 (old)		rig

New rigs	0
Old rigs	4
Drilling	0

Total..... 4

Alma.

3, M J McMullan & Co No 5 (old)	rig
23, Vance & Horton (old)	rig

Gibbs, L B Wood & Co	No 5.....	drilling
"	No 6.....	rig
"	No 7.....	rig
Knapp,	No 3.....	rig
Huidekoper,	No 4.....	drilling
Moore,	No 1.....	drilling
Anderson, Brown Bros		rig
Lot 150, S S Fertig		drilling
Proper, Bovee & Duck	No 3.....	drilling
Lot 150, Nelson Farrell	No 13.....	sand
" 150,	No 14.....	rig bldg
" 135, (B & R tract) D Emery & Co		drilling
" 137, G P Kepler & Co (old)		rig
" 149,	No 17.....	drilling
" 149,	No 18.....	rig bldg
" 238, J B Jennings & Grandin		(old) rig
Spring Creek, (Shaw) Stewart & Co		rig
Enterprise, Dibble, Dibble Bros.		drilling

New rigs.....	9
Old rigs and shut down.....	3
Drilling.....	13

Total 25

Miscellaneous—Elk County, Etc.

2020, Clark, Foster & Andrews		rig
2033, Clark & Foster No 4		drilling
2033, Porter, Thyng & Co No 7		drilling
2033, Highland Oil Co No 2		drilling
3663, Boyer, Simpson & Co No 4		drilling
2027, Taylor, Torrey & Co No 1 (shut down)		sand
2032, Boggs, Rosenberg & Co No 3 (fishing)		sand
2032,	No 4	rig
2676, (McKean) Wilcox Tannery Co.		rig

Warren and Forest Counties.

Sutton Hill, A F Fritts (old)		rig
Youngsville, (John Higgins) Scranton Oil Co (old)		rig
Proper, (Tionesta) Groves & Co		rig
Kepler, (Harmony twp) Karney Bros.		sand
Dawson, (Stewarts Run) Taylor, Torrey & Murphy No 2		drilling
Josly, (Harmony twp) Wood & Co		sand
Winegard, (Forest Co) Hunter & Co		rig
Wagner & Curll, (Barrett twp) Parker parties		rig

New rigs.....	7
Old rigs.....	3
Drilling.....	8

Total 18

Lower Country.*Venango and Other Sections.*

Allegheny Bank lands, Oil City Fuel Supply Co (old)		rig
McBride, Thomas Smith (old)		rig
Kaufman, A P Dale No 10		drilling
Osmer, Galbraith & Parker (old)		rig
Bully Hill, (Miller) Smith & Galbraith No 3		sand
Mt Hope, Dr Galbraith No 4		drilling
Slab Furnace, S P McCalmont (old)		rig
Rynd, Wratten & Co (old)		rig
Columbia, Columbia Oil Co No 174		rig
" No 175		rig bldg
Tract 47, J J Fisher No 10 (old)		rig
Blood, P Bankson		drilling
Curtis, Thos Smith		rig
Nagara, H Wilbur		rig bldg
Pioneer, (Keech) J Stillwagon		rig
" (McElheney) Pres McCray		rig
Pithole, (Blank) Duke & App'ebec (old)		rig

Vicinity Pleasantville.

Landas, W P Black No 6 (old)		rig
Atkinson, (Shamburg) W P Black No 2		drilling
Dailey,		rig bldg
Sheridan, Doolittle & Haskell		rig
Poor, Joy & Co		rig bldg
Fisher, Palmer & Co		rig bldg
Fisher, Yung & Locke No 3		rig
Sheppard, J Sheppard (old)		rig

Tipperary, Hall's Run, Etc.

Heckathorn, Phinney & Bishop		drilling
Moore, Bee s & Co No 3 (shut down)	750	
" Speechley & Co No 2 (old)		rig
Burns, Detrich & Warfield No 3		drilling
Brough, Dufur & Co		rig
C Rumbold, J V Ritts No 2		drilling
J R Grant, Kelley & Smullin		rig
Plumer, Samuel Plumer		drilling

Tarkill.

Webb, Taylor, Torrey & Murphy No 1	800	
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Rockland or Red Valley.

W Shafer, Dale Bros		drilling
Nickleville, (Persing) Myers Bros		rig

Vicinity Emlenton.

J W Smith, Riverside Oil Co No 8		rig
Hays, James Bennett		drilling
Byrom Centre, (Robin on) Middleton & Co	1000	
" R Sloan, Duncan & Co		sand

Smoky District.

John Hanley, Sheasley & Co		drilling
Biglow, Shirk & Co		drilling
Malett, Duffield & Co		drilling

New rigs.....	15
Old rigs and shut down.....	11
Drilling.....	17

Total estimated 43

Clarion.

Russel, Berlin & Sons No 3		drilling
Widiken, " No 1		drilling
Berlin, Berlin & Sons No 15 (old)		rig
John Hen-1, Koch Oil Co No 8 (old)		rig
Lloyd, Dr Metzger (old)		rig
Shreffler, McCallom & Co (old)		rig
Wagner & Curll, J V Ritts (old)		rig
Brown, J V Ritts (old)		rig
Heasley, Heasley & Co (old)		rig
De oe, McKinney & Co		rig bldg
Fillman, J R Fillman		rig
Reed Frampton, Stewart & Co		rig

New rigs.....	3
Old rigs.....	7
Wells drilling.....	2

Total 12

Butler and Armstrong.

F Miller, W G Crawford & Co (old)		rig
Chas Duffey, Hoch & Co (old)		rig
Was-ington twp, Armstrong & Co	300	
Gump r, Ward & Stoup (old)		rig
Gelbech, T W Phillips & D Osborne No 4	1200	

" " No 5		rig
" " No 6		rig
Dunbar, " No 1	1200	
" " No 2	1500	
" " No 3	1500	
" " No 4	1200	
Behm, " No 1	1200	
" " No 2	1100	
" " No 3	300	
" " No 4	300	
" " No 5	300	
John Ehrman, " No 1	300	
Jesse Barto, " No 1	300	
Dickey, " No 2	1400	rig bldg
Emrick, " No 3	1400	
Z Markle, " No 1	1 00	
Stahm, " No 1	800	
Blakeley, Leidecker Bros No 6		rig
" Johnson & Root No 2 (old)		1000
" No 3		

Reibold, Fisher Oil Co & Painter Bros	1125	
Dunbar, Reep, Westerman & Co	1300	
Peiffer, McTamany, Greenlee & Co No 1	1100	
" No 2	1200	
" Marshall Oil Co	1300	
Behm, Burchfield No 3	1200	
Dunbar, Root & Johnson	800	
Rev Hickey, Brushwood Oil Co No 5	300	
Chas Duffey, M Finegan No 6	1100	
-axon Station, Brown, Hovis & Co		drilling
McClymons, Standard Plate Glass Co (gas)	500	

Boyd, Shenango Gas Co (for gas)	1600	
Henry, Shenango Gas Co (for gas)	1100	
McCue, Brady & Simpson	1100	
Widow R-ley, McCullugh & Co	1100	
Coyle, Fisher Oil Co No 2		drilling
Ball, P C L & P Co	300	
Saxonsburg, Kistadden & Co	300	
" Iman, McBride & Co		drilling
" Boyce & Co		drilling
Nort East But'er, Morrison & Co		drilling
Barnh rt, Vensel, Larkin & Co No 5		drilling
Frederick, Brady & Simpson No 3		rig bldg
Jos Maharg, Hunter & Co		rig bldg
Kipples Corners, Mortimer & Co		1300
Valencia, Munhall & Co		drilling
Unionville, Unknown		

Martinsburg.

Knox, Hoffman & Co		sand
Knox, Jordan & Co No 2	900	
G Shakeley, M P Black	800	
Story, Kelley	600	
Shakely, Asa Byers	300	

Thorn Creek.

Dixon, Christie & Co		sand
Cooper, Thayer & Crosby & Anchor Oil Co No 1	1450	

Burton, Russell & Greenlee No 2	300	
" Farmers Oil Co	1600	
Harbison, Counors & Fishel		rig
Bulford, Iman, Waldron & Co		rig
Dixon, Tom and Jerry Oil Co	300	
Bulford, Klingensmith	1500	

New rigs.....	12
Old rigs.....	4
Drilling.....	48

Total 64

Washington.

I Wilson, Forest Oil Co (old)		rig
Johnson, " (old)		rig
Martin heirs, John McKeown No 4	1600	
" No 6	150	

Cameron, Willets, Young & Chartiers Oil Co No 3		sand
" " No 10	1050	
" " No 11		rig

Munce Heirs, Willets & Son No 23 (old)		rig
" " No 24 (old)		rig
" " No 26 (old)		rig
" " No 20		drilling

Baker, Dyer & Co	2200	
Martin, Wheeling Oil Co No 4	400	
Coal Center, Hornbake	1500	
Wiles, C O & G Co No 1		rig bldg
" " No 2	850	
McKeesport, Stone & Co		drilling
Thome, Lee & Shank No 3		drilling
Wright, Chartiers Oil Co & F W Andrews (old)		rig

Workman, Union Oil Co No 3	1800	
Bane, Ten-Mile Oil Co (for gas)		rig
Gordon, P L & H Co No 7		sand
Welsh, Welsh Oil Co	2000	
Fergus, Chartiers Oil Co No 3	1650	
" No 4		rig

Weaver, C O & Gas Co No 3		rig
Davis, Union Oil Co No 6	350	
Wade, B B Campbell & Co No 4	1500	
" " No 5	700	
California, J M Guffey (for gas)		rig
Carson, Schmertz & Co (for gas)		rig bldg
Whittlesee, Caldwell & Co No 2		sand

Taylorstown.

R Hamilton, Wheeling Natural Gas Co No 1 (for gas)	1700	
Blayne, Hart Bros & Co No 2	2300	
" " No 3	600	
Carrothers, West Virginia Natural Gas Co	1600	
Donahay, " "	1700	
R Cundall, Reed, Vandergrift & Co No 2	1300	
Flack, West Virginia Nat Gas Co	800	
Hodgeus, " "		rig

New rigs.....	5
Old rigs and shut down.....	6
Drilling.....	23

Total 34

Shannopin.

Thos Pinkerton, J S McKelvy (old)		rig
Charles Eachel, Raccoon Oil Co No 4 (old)		rig
A P Morrow, Raccoon Oil Co & Solar Oil Co No 25		sand
Stone, J M Guffey & Co No 3		sand
Riddle, Philadelphia Co (fishing)		1000
McKee, (Oakdale) Forest Oil Co		sand
Elizabeth twp, Frederick & Callahan (abd)		1100
John Morrow, Raccoon Oil Co No 4 (old)		rig

Greene County, Etc.

Fordyce, E M Hukill & Co No 1 (shut down)	1360	
Garard, E M Hukill & Co No 1 (shut down)	1060	
Garard, E M Hukill & Co No 2 (shut down)		drilling
" " "		rig
Hathaway, E M Hukill & Co No 1 (shut down)	1060	
Mt. Morris, E M Hukill & Co No 1		drilling
Longanecker, " (old)		rig
Ninevah, Johnston & Hamilton		rig
Board Tree, Wheeling Natural Gas Co	2300	
McGinnis farm, Wheeling Natural Gas Co (shut down)	1100	
Sugar Grove, Wheeling Natural Gas Co (shut down)	1200	
Moundsville, J W Craig & Co		drilling
Bristoria, Forest Oil Co (fishing)		1100
Biddle, Hukill & Co		drilling

New rigs.....	1
Old rigs and shut down.....	3
Drilling.....	9

Total 13

The Lima Oil Field in May.

The Ohio oil field, as at present developed, consists of four distinct pools on a stretch of country extending from the north end of Henry township in Wood county to St. Marys in Auglaize county, a distance of 60 miles.

Beginning at the north with North Baltimore, where some very large wells have been found, dry holes are encountered in sufficient number to cut off all chances for an extension to the southwest, but there still remain opportunities for an extension to the northeast. Between North Baltimore and Findlay are numerous dry holes, which condemn large areas of territory.

The Findlay pool at present contains 111 producing wells. It runs nearly due west from Findlay, and is about five miles in length by two in width.

At Cannonsburg, midway between Findlay and Lima, a well was struck that started at 40 barrels a day. It exhausted itself within ten days and is now surrounded on all sides by small wells and dry holes.

The largest of the oil pools is that of Lima, which is eight miles in length, extending from the Tunget well on the north to a point three miles south of Cridersville on the southwest. Beyond these points salt water has been found in large quantities. The pool has an irregular width of from one and a half to two and half miles. But the territory even within the defined limits is spotted and dry holes are often found in the most favorable locations. There are over 325 producing wells in this district, which has not been drilled very thickly as yet. The producers at Lima and Findlay are organizing to effect a shut down of drilling operations until oil is 40 cents a barrel.

St. Marys, to the extreme southwest, is doubtless very limited in extent. Only three producing wells have been discovered and dry holes have thus far rewarded all efforts at finding an outlet to the district.

The price of Lima oil was reduced from 30 to 27½ cents a barrel on May 3rd, and this was followed by a further cut to 25 cents on the 17th.

Thirty-nine new wells were reported as completed in the Ohio fields in May, and on the last day of the month there were 43 drilling wells and 45 rigs up and building. The total number of producing wells in the field on June 1st is estimated at 459, and the average daily production for May was 15,396 barrels. Fifty-four new wells were completed in April, and the daily average production of the field for that month was 12,155 barrels.

The figures as reported by the pipe lines for the month of May were as follows:

	Barrels.
Total runs Buckeye Pipe Line.....	430,801
Total runs Excelsior Pipe Line.....	18,600
Total accumulation at wells.....	27,900
Total production.....	477,301
Total average production per day.....	15,396
Total shipments May, Buckeye Pipe Line.....	62,113
Total shipments May, Excelsior Pipe Line.....	18,600
Total shipments during month of May.....	80,713
Total average shipments per day.....	2,603
Increase of stocks in iron tanks in May.....	368,688
Total stocks in iron tanks May 1st.....	1,492,664
Total stocks in iron tanks June 1st.....	1,861,352

FIELD OPERATIONS.

	Wells Com.	Drilling.	Rigs.
North Baltimore district.....	5	15	14
Findlay district.....	15	12	8
Lima district.....	18	14	23
St. Marys district.....	1	2	0
Total.....	39	43	45

THE Ohio "idea" of booming a town is something new, and real estate speculators in the Buckeye State are wildly happy.

Recent Oil and Gas Incorporations.

PENNSYLVANIA.

The Apollo Gas Co., Apollo, Armstrong county; capital stock \$20,000. Incorporators, Geo. J. McMurty, C. W. Bachelor, O. H. Childs, of Pittsburg.

East Brady Caloric Co., East Brady, Clarion county; capital stock \$15,000. Incorporated by A. M. Marshall, of Pittsburg, Wm. Wilson, C. K. Smith.

West Middlesex Gas-Light and Fuel Co., Mercer county; capital \$3,000. Jos. Russell, H. S. Newkirk, J. M. Johnson, incorporators.

Rochester Heat and Light Co. of Rochester, Beaver county; capital \$30,000. Perry Brown, H. M. Camp, W. P. McConnell, of Beaver, are the incorporators.

Citizens Natural Gas Co., Beaver Falls, Beaver county; capital \$50,000. Edward L. Barton, President, Jno. Barton, W. A. Mellon, of Pittsburg, incorporators.

Southwest Natural Gas Co., Westmoreland and Fayette counties; capital \$300,000. J. M. Guffy, A. W. Mellon, of Pittsburgh, R. Coulter, of Greensburg, incorporators.

OHIO.

Manhattan Gas and Oil Co., Toledo; capital \$100,000.

Fidelity Gas and Oil Co., Fidelity; capital \$10,000.

Alaska Oil and Mutual Gas Co., Archibald; capital \$50,000.

Shelby Gas, Oil and Pipe Co., Shelby; capital \$25,000.

Arcanum Nat. G. & O. Co., Arcanum; capital \$20,000.

Northside Nat. G. & O. Co., Cincinnati; capital \$4000.

Eaton Pet. & Nat. Gas Co., Eaton; capital \$10,000.

Eureka Oil and Gas Co., Lynchburg; capital \$5000.

Ansonia Oil and Gas Co., Ansonia; capital \$5000.

Sherwood G., O. & Min. Co., Sherwood; capital \$5000.

West Toledo G. & O. Co., West Toledo; capital \$10,000.

Loveland Nat. G. & O. Co., Loveland; capital \$5000.

Citizens Nat. G. & O. Co., Urbana; capital \$25,000.

Payne Nat. Gas & Oil Co., Payne; capital \$5000.

Massillon Nat. G. & O. Co., Massillon; capital \$25,000.

Germantown Natural Gas and Petroleum Co., Germantown; capital \$10,000.

Spring Valley Natural Gas, Oil & Refining Co., Spring Valley; capital 5000.

Bellefontaine Oil & Gas Well Co., Bellefontaine; capital \$10,000.

Wood County Oil & Gas Co., Bowling Green; capital \$100,000.

Big Walnut Nat. G. & O. Co., Kingston; capital \$4000.

National Nat. G. & Refining Co., Xenia; capital \$10,000.

Xenia Nat. G. & Coal Oil Co., Xenia; capital \$3000.

Citizens Nat. G. & O. Co., Cleveland; capital \$50,000.

Fort Recovery Natural Gas & Oil Co., Fort Recovery; capital \$10,000.

Young Men's G. & O. Co., Wapakoneta; capital \$10,000.

Prospect Oil & Gas Co., Prospect; capital \$4500.

Springfield Power and Heating Co., Springfield; capital \$20,000.

Neapolis Nat. Gas & Oil Co., Neapolis; capital \$5000.

Georgetown N. G. & O. Co., Georgetown; capital \$3000.

New Bremen Nat. Gas & Oil Co., New Bremen; capital 5000.

Metropolitan Nat. Gas & Oil Co., Cincinnati; capital \$20,000.

Cedarville Nat. G. & O. Co., Cedarville; capital \$3000.

Hankey-Sands Gas & Oil Co., Toledo; capital \$50,000.

Lockland and Wyoming Natural Gas Co., Lockland; capital \$5000.

Alum Creek N. G. & O. Co., Alum Creek; capital \$3000.

New Paris Nat. G. & O. Co., New Paris; capital \$20,000.

Eastern Petroleum & Natural Gas Co.; capital \$10,000.

Perrysburg Township Gas & Oil Co., Perrysburg; capital \$5000.

Guarantee Gas Co., Wellsville; capital \$50,000.

Kinsman Oil & Gas Co., Kinsman; capital \$20,000.

City Oil & Gas Co., St. Marys; capital \$50,000.

Natural Gas & Oil Co. of Morrow; capital \$3000.

Cochranon N.G. & O. Co., Cochranon; capital \$3000.

Citizens Gas & Oil Co., Spencerville; capital \$25,000.

German Gas & Oil Co., Cadiz; capital \$5000.

Mt. Healthy Gas, Oil & Water Co., Mt. Healthy; capital \$5000.

Enterprise Exploring Co., Hicksville; capital \$10,000.

Greenville Nat. G. & O. Co., Greenville; capital \$1000.

Moscow Nat. Gas & Oil Co., Moscow; capital \$3000.

MISCELLANEOUS.

People's Nat. Gas Co., Nashville, Tenn.

Virden Gas & Oil Co., Virden, Ill.; capital \$3000.

Dayton Oil & Gas Co., Dayton, Tenn.; capital \$100,000.

Columbus Nat. G. Co., Columbus, Ind.; capital \$10,000.

Mankato Coal, Oil & Mineral Co., Mankato, Minn.

Mattoon Gas & Fuel Co., Mattoon, Ill.; capital \$4000.

Flora Coal, Gas & Oil Co., Flora, Ill.; capital \$3000.

Champaign Mutual Gas, Oil & Coal Co., Champaign, Ill.; capital \$3000.

Hamilton Nat. Gas & Oil Co., Hamilton, Tenn.; capital \$50,000.

Union G., O. & Mineral Co., Peoria, Ill.; capital \$20,000.

Kiowa Coal & Gas Co., New Kiowa, Kan.

Vevay Gas, Oil & Mining Co., Vevay, Ind.; capital \$100,000.

Bellevue Nat. Gas & Oil Co., Newport, Ky.

Amboy Nat. G. & O. Co., Amboy, Ind.; capital \$10,000.

Charleston Coal, Oil & Gas Co., Charleston, Ill.

Glasgow Oil, Mining and Nat. Gas Co., Glasgow, Ky.; capital \$100,000.

Decatur Oil & Gas Co., Hartselle, Ind.; capital \$200,000.

Warsaw Nat. Gas & Mineral Co., Warsaw, Ind.; capital \$12,000.

Burrton Oil, Gas & Mining Co., Burton, Kan.; capital \$10,000.

Greensburg Water, Gas, Oil & Mining Co., Greensburg, Kan.; capital \$5000.

Garden City Nat. Gas & Coal Co., Garden City, Kan.; capital \$25,000.

Hutchinson Nat. Gas Co., Hutchinson, Kan.; capital \$25,000.

Vinton Oil & Gas Co., Vinton, Iowa; capital \$100,000.

Kalamazoo Nat. Gas & Fuel Co., Kalamazoo, Mich.; capital \$10,000.

Hartford City Nat. Gas & Oil Co., Hartford City, Ind.; capital \$25,000.

Getzville Nat. Gas, Fuel & Lighting Co., Getzville, N. Y.; capital \$100,000.

May Production Report.

Reports of stocks at wells received by THE PETROLEUM AGE show an average decrease of 1.7 barrels to the well in the Bradford and of 3.6 barrels to the well in the Allegany field during the month of May. The total number of wells connected with the pipe lines June 1st is estimated at 14,065 in the Bradford and 4000 in the Allegany field. Taking the above figures as the basis of an estimate on the daily production, stocks in tanks at wells were decreased at the rate of 804 barrels a day in the Bradford and 465 barrels a day in the Allegany field. The total daily pipe line runs by both lines averaged 27,764 barrels a day in May. Subtracting the reduction in stocks the Bradford and Allegany produc-

tion averaged 25,495 barrels a day in May, which may be placed at 4000 barrels a day for the Allegany and 21,495 barrels a day for the Bradford field.

Several large producers in the Bradford field are making arrangements to ship their oil out of the region independently of the present pipe lines now in the field, and henceforth the runs of the National Transit and Tidewater companies will not represent the entire amount of oil taken from the wells from month to month.

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

Field.	No. Wells		Average	
	May 1.	June 1.	per well May 1.	per well June 1.
Clarendon and Tiona	64	65	28	26
Cherry Grove	22	22	45	41
Cooper District	106	106	41	40
Lower Country	173	173	102	99
Miscellaneous	179	179	67	62

Accepting the outside runs, which are made up of the producing fields outside of Bradford and Allegany, as representing the production outside of those two fields, an estimate on the yield for May and April is as follows:

Field.	May. Barrels.	April. Barrels.
Bradford	21,495	21,880
Allegany	4,000	4,447
Outside Runs	36,758	37,120
Total	62,253	63,447
Macksburg	970	1,110
Total with Macksburg	63,223	64,557
Decrease per diem	1,334	

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region. The runs from Washington are included with the outside field. The Lima runs by the Buckeye Pipe Lines were 14,486 barrels a day in May, 11,760 barrels in April, 9777 barrels in March, 7394 barrels in February, 4226 barrels in January, 4374 barrels in December, 4038 barrels in November and 4112 barrels in October.

The following table shows the comparative production for 1884, 1885, 1886 and 1887:

	Bradford.		Allegany.		Outside Runs.		Total Prod.	
	1885.	1884.	1885.	1884.	1885.	1884.	1885.	1884.
January	28,675	31,806	8,260	11,264	18,594	16,140	55,529	59,240
February	27,051	32,378	7,196	11,607	19,800	18,561	54,047	62,546
March	26,444	31,912	7,342	11,768	19,923	19,764	53,709	63,444
April	27,413	32,442	7,169	11,848	23,067	19,162	57,649	63,452
May	27,231	33,922	7,049	11,547	21,225	19,549	55,505	65,018
June	29,272	33,753	7,463	11,108	21,559	19,977	58,294	64,838
July	30,309	34,031	7,139	11,218	19,273	20,870	56,721	66,119
August	29,858	33,353	7,065	10,384	18,608	22,830	55,531	65,567
September	30,205	32,976	7,186	9,877	21,269	22,514	58,600	65,367
October	30,180	31,758	6,747	9,356	23,161	22,762	60,088	63,876
November	31,355	31,789	7,002	8,642	23,087	23,557	61,444	63,988
December	29,223	29,516	6,196	8,193	24,184	22,918	59,603	60,297
	1886.	1885.	1886.	1885.	1886.	1885.	1886.	1885.
January	28,677	28,675	6,378	8,260	22,217	18,594	57,272	55,529
February	28,588	27,051	6,651	7,196	22,603	19,800	57,840	54,047
March	27,947	26,444	6,137	7,342	25,680	19,923	59,764	53,709
April	27,807	27,413	6,527	7,169	28,693	23,067	63,027	57,649
May	27,327	27,231	6,535	7,049	34,515	21,225	68,198	55,505
June	27,860	29,272	6,554	7,463	40,040	21,559	74,454	58,294
July	27,046	30,309	6,350	7,139	40,491	19,273	73,887	56,721
August	26,695	29,858	6,200	7,065	43,762	22,830	76,657	55,531
September	26,674	30,205	5,994	7,186	45,560	21,269	78,228	58,660
October	25,454	30,180	6,017	6,747	45,538	23,161	77,009	60,088
November	24,503	31,355	5,860	7,002	40,817	23,087	71,180	61,444
December	22,422	29,223	5,178	6,196	38,783	24,184	66,383	59,603
	1887.	1886.	1887.	1886.	1887.	1886.	1887.	1886.
January	23,269	28,677	5,563	6,378	34,254	22,217	63,086	57,272
February	22,930	28,588	5,049	6,651	35,745	22,603	63,724	57,840
March	22,327	27,947	4,930	6,137	36,135	25,680	63,392	59,764
April	21,880	27,807	4,447	6,137	37,120	28,693	63,447	63,027
May	21,495	27,148	4,000	6,535	36,758	34,515	63,223	68,198

The New York Petroleum Exchange.

The annual election of the Consolidated Stock and Petroleum Exchange took place June 13th, but, though there were two tickets in the field, there was no contest except over two or three places in the Governing Committee and in the Arbitration Committee. President Wilson, Vice-President Tack, Treasurer Stanton and Chairman Peters were re-elected without opposition.

The annual report of the Exchange was issued the same day. It is an interesting exhibit of the work of the year. The Consolidated Exchange has become an important institution. It does all the oil and mining stock and one-third of the railway stock business of Wall street. During the year 1,721,216,000 barrels of crude oil were sold in the Exchange. The transactions in railway stocks amounted to 51,416,560 shares against 17,913,131 shares in the preceding year. This is within 50 per cent of the business of the Stock Exchange. There were \$73,556,810 worth of miscellaneous securities sold. There was quite a boom in mining stocks, 11,297,105 shares being traded in as against 3,176,982 shares in 1885-6. The Exchange now has a membership of 2353 and has a surplus fund of \$389,681.70.

Petroleum in Los Angeles County.

Mr. W. L. Hardison, general manager of the Sespe Oil Company, is in the city, and from him it is learned that his company has just closed a contract in San Francisco with the Fulton Iron Works for a steamer to cost \$55,000 especially constructed for transporting oil from the company's wells, from Hueneme to San Francisco. Her dimensions will be: length, 160 feet; beam, 30 feet; depth of hold, 13½ feet, with a capacity of 35,000 barrels. The oil will be stored in bulk in the hold. The vessel is to be provided with engines that will give a speed of nine knots per hour, and with receiving and discharging pumps capable of handling 20,000 gallons per hour. Two-inch pipes are being taken up and replaced by others of four inches diameter. One 32,000 gallon tank has been built and another soon will be. It is also learned that a four-inch pipe line will probably be laid to Los Angeles in the near future, so that the supply of crude oil for fuel purposes will be largely increased.—*Los Angeles Express*.

Zoar.

There is nothing new to report from the Zoar mystery. The stalwart drillers and tool-dressers remain on duty at the well with their little shot guns. Sill & Co., the parties who are furnishing J. O. Marshall with the sinews of war for his excursions through the field, are drilling a well on the Coon farm, a short distance northeast of the mystery on the White farm. Roth, Pepper, Dyer and E. H. Jennings are building a rig on the Snyder heirs farm, in the southern part of Persia township. The well is about ten miles distant from the Zoar hole in a south-westerly direction. In this number of the AGE we present a generalized section of the rocks of Erie and Cattaraugus counties, with an article on the geology of South-western New York, by Prof. H. S. Williams, of Cornell University. While the Professor's article may not soothe the parties who want to boom the land of Zoar, it will prove of interest to oil men.

THE second gas well at Hartford City, Indiana, 60 miles northeast of Indianapolis, was drilled four feet deeper in the Trenton rock on June 20, and is reported to have a capacity of 16,000,000 cubic feet a day. Its previous output was about 9,000,000 feet a day. It is the largest gasser in the State.

LIMA oil has been reduced to 20 cents a barrel—less than half a cent a gallon at the wells.

TOLEDO is supplied with natural gas through two pipe lines from wells in the Findlay gas district.

A GOOD gas well has been drilled on the Benjamin Berg farm, near Cicero, in Hamilton county, Indiana.

OIL is reported to have been discovered near Brownstown, Indiana, at a depth of 1352 feet. It is of the 20 cent kind variety.

MESSRS. BOGGS & CURTIS, of Bradford, are drilling a gas well under contract for an enterprising company at Birmingham, Alabama.

THE Manufacturers' Natural Gas Co. of Bradford will lay a 10-inch main from the Kane gas district to Bradford. It will cost \$125,000.

FARMER DEAN filled the average Findlay citizen full of enthusiasm at his speech at Findlay's great jubilee banquet. Colonel Sellers himself could not have made the occasion more glorious.

THE following Ohio natural gas companies have recently increased their capital stock: Galion Natural Gas and Oil Company, from \$2,400 to \$6,000; Toledo Natural Gas Company, from \$100,000 to \$4,000,000; Fidelity Natural Gas Company, from \$1,875 to \$3,750.

HERR FRIEDRICH SIEMENS has designed a furnace for smelting copper in which the heat is derived solely by radiation from petroleum and steam spray flames. The flames are not in contact with the walls of the furnace at all and everything depends upon radiation, but the naphtha or petroleum employed will melt from fifteen to twenty times its weight of ore. It is employed on a large scale at Dr. Warner Siemens' copper works in Russia.

THE natural gas ordinances of Indianapolis provide that gas must be supplied that city at 7 cents per 1000 for manufactures and 10 cents per 1000 for domestic use. The authority for the Standard states that "no responsible company will come in under such an ordinance." Gas has been discovered in large quantities within 20 miles of the city, and before Indianapolis grants exclusive privileges to any corporation she had better study the example of Findlay and be wise.

COL. A. I. WILCOX has secured the right of way for a pipe line from the new oil development in Highland township, Elk county, across the country to Johnsonburg. The distance is about thirteen miles and the line will connect with three railroads. The Inter-State Commerce bill will work a change in the oil situation in the region in the near future. Less energy devoted to drilling and more directed toward taking care of the product is what is wanted in the region.

THE total exports of petroleum from America, in gallons, according to a German circular, from January 1 to May 13, for the years 1886 and 1887, have been as follows:

	1887. Gallons.	1886. Gallons.
To Europe.....	125,733,849	118,046,272
To East Indies, etc.....	40,154,354	59,422,580
Total.....	165,913,203	177,468,852

FIELD OPERATIONS SUMMARIZED,

WELLS COMPLETED, WITH THE ESTIMATED PRODUCTION ON THE LAST DAY OF THE MONTH.

ALLEGANY FIELD.

Division of Field.	MAY, 1887.			APRIL, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Scio.....	1	5	0	0	0	0
Alma.....	0	0	0	1	3	0
Wirt.....	0	0	0	2	14	0
Bolivar.....	1	3	0	0	0	0
Clarksville.....	0	0	0	0	0	0
Genesee.....	0	0	0	0	0	0
Miscellaneous.....	1	0	1	0	0	0
Total.....	3	8	1	3	17	0

BRADFORD FIELD.

Division of Field.	MAY, 1887.			APRIL, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
E. and W. Branches.....	3	9	1	3	10	1
Kendall Creek.....	3	18	0	0	0	0
Foster Brook.....	0	0	0	1	8	0
Knapp's Creek.....	1	6	0	3	16	0
Four Mile.....	1	8	0	1	5	0
Indian & Meeks Creeks.....	3	19	0	3	21	0
Cole Creek.....	2	10	1	1	12	0
Kinzua.....	2	16	0	4	26	1
Miscellaneous.....	0	0	0	0	0	0
Total.....	15	86	2	16	98	2

WARREN AND FOREST.

District.	MAY, 1887.			APRIL, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Glade.....	12	350	4	8	93	3
Clarendon.....	12	58	0	10	44	0
Tiona.....	6	33	0	5	28	0
Cooper.....	0	0	0	1	10	0
Balltown.....	2	20	0	2	8	1
Kane.....	2	6	1	1	5	0
Grand Valley.....	19	164	3	17	125	4
Miscellaneous.....	11	90	3	8	59	2
Total.....	64	721	11	52	372	10

LOWER COUNTRY.

District.	MAY, 1887.			APRIL, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Venango.....	26	138	7	37	163	17
Clarion.....	10	45	7	8	60	3
Butler and Armstrong.....	19	1479	7	25	3310	2
Washington.....	8	505	1	18	2148	2
Shoustown, Etc.....	1	200	0	10	70	7
Total.....	64	2367	22	98	5751	31

GRAND SUMMARY.

District.	MAY, 1887.			APRIL, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Allegany.....	3	8	1	3	17	0
Bradford.....	15	86	2	16	98	2
Warren and Forest.....	64	721	11	52	372	10
Lower Field.....	64	2367	22	98	5751	31
Total May.....	146	3182	36	169	6238	43
Total April.....	169	6238	43			
Difference.....	23	3056	7			

Rigs Up and Building—Wells Drilling.

ALLEGANY FIELD.

Division of Field.	MAY 31, 1887.				APRIL 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Scio.....	0	4	0	4	0	4	1	5
Alma.....	0	5	0	5	0	5	0	5
Wirt.....	0	8	2	10	1	9	1	11
Bolivar.....	0	2	0	2	0	2	1	3
Genesee.....	0	8	0	8	0	8	0	8
Clarksville.....	2	6	3	11	2	5	1	8
Miscellaneous.....	0	0	0	0	0	0	1	1
Total.....	2	33	5	40	3	33	5	41

BRADFORD FIELD.

Division of Field.	MAY 31, 1887.				APRIL 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
E. and W. Branches.....	1	8	3	12	1	9	4	14
Kendall Creek.....	3	0	3	6	0	0	0	0
Knapp's Creek.....	0	3	2	5	0	5	1	6
Foster Brook.....	1	4	1	6	2	4	2	8
Four Mile.....	1	3	0	4	0	3	1	4
Indian Creek.....	2	1	2	5	3	1	2	6
Cole Creek.....	0	5	1	6	0	5	2	7
Kinzua.....	3	0	4	7	2	0	4	6
Miscellaneous.....	0	0	0	0	0	0	0	0
Total.....	11	24	16	51	8	27	16	51

WARREN AND FOREST.

Division of Field.	MAY 31, 1887.				APRIL 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Glade.....	6	0	5	11	7	0	7	14
Clarendon.....	5	5	7	17	3	6	9	18
Tiona.....	3	1	6	10	1	1	2	4
Cooper.....	0	2	1	3	0	2	0	2
Balltown.....	1	3	0	3	1	2	1	4
Kane.....	1	3	1	5	0	4	1	5
Grand Valley.....	9	3	13	25	12	3	10	25
Miscellaneous.....	7	3	8	18	3	3	10	16
Total.....	32	19	41	92	27	21	40	88

LOWER COUNTRY.

Division of Field.	MAY 31, 1887.				APRIL 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Venango.....	15	11	17	43	18	14	20	52
Clarion.....	3	7	2	12	2	7	9	18
Butler & Armstrong.....	12	4	48	64	20	5	27	52
Washington.....	5	6	23	34	1	9	29	39
Shoustown, Etc.....	1	3	9	13	0	3	12	15
Total.....	36	3	99	166	41	38	97	176

GRAND SUMMARY.

Field.	MAY 31, 1887.				APRIL 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Allegany.....	2	33	5	40	3	33	5	41
Bradford.....	11	24	16	51	8	27	16	51
Warren and Forest.....	32	19	41	92	27	21	40	88
Lower Country.....	36	3	99	166	41	38	97	176
Total.....	81	107	161	349	79	119	158	356
Total April 30.....	79	119	158	356				
Difference.....	2	12	3	7				

THE latest work on Petroleum and Natural Gas in Ohio, with valuable geological map, by Prof. Orton, can be obtained at the office of the PETROLEUM AGE, or will be sent postpaid on receipt of price, \$1 in paper and \$1.25 bound in cloth.

THE contract for drilling a test well for natural gas in the town of Ithaca, Tompkins county, New York, has been awarded to the Empire Augur Company of Ithaca, of which F. W. Rust is manager. The contractors will furnish everything and sink the hole to a depth of 3250 feet for \$1.50 per foot. The well of course will not be drilled to so great a depth unless the directors desire it. It is to be located on the Mack heirs property along the Spencer road.

SUMMARY of the Statement of the Tidewater Pipe Company, Limited, for May, 1887:

Quantity of crude petroleum in custody at beginning of May.....	Barrels.	1,556,305.60
Quantity of crude petroleum at close of May.....	1,762,807.87	
Less sediment and surplus.....	194,829.09	
Receipts during May.....	1,567,978.78	
Received in iron tanks.....	183,207.78	
Deliveries during May—to refiners.....	222,821.19	
to other parties.....	222,821.19	
Outstanding certificates, accepted orders, etc.....	847,000.00	
Credit balances.....	720,978.78	
Total liabilities, May 31, 1887.....	1,567,978.78	

APRIL SUMMARY.

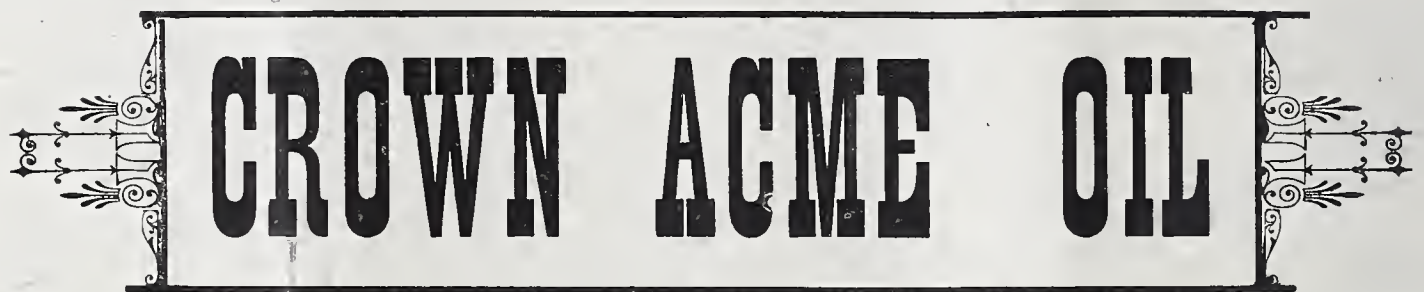
Quantity of crude petroleum in custody at beginning of April.....	Barrels.	1,519,065.93
Quantity of crude petroleum at close of April.....	1,739,528.07	
Less sediment and surplus.....	183,222.47	
Receipts during April.....	1,556,305.60	
Received in iron tanks.....	177,683.06	
Deliveries during April—to refiners.....	193,167.99	
to other parties.....	193,167.99	
Outstanding certificates, accepted orders, etc.....	783,000.00	
Credit balances.....	773,305.60	
Total liabilities April 30, 1887.....	1,556,305.60	

THE PETROLEUM AGE.

ACME OIL COMPANY,

→ **REFINERS OF PETROLEUM** ←

MANUFACTURERS OF THE



Prepared with Great Care for Family Use.

ABSOLUTELY SAFE,

AND THE

Best Illuminator in the World.

WORKS AT OLEAN, N. Y., & TITUSVILLE, PA.

MAIN OFFICE, 26 BROADWAY, N. Y.

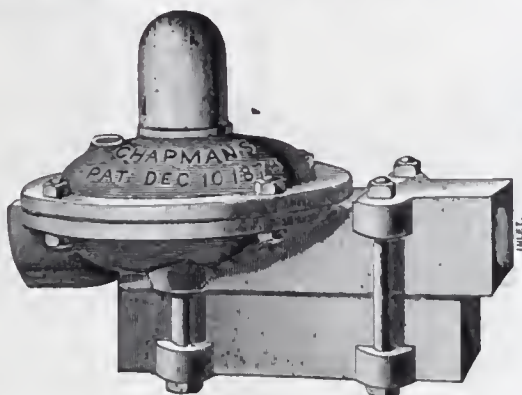
THE PETROLEUM AGE.

J. L. CHAPMAN & CO.,

P. O. Box 530, PHILADELPHIA, PA.

Natural Gas

Regulators.



Automatic

Stop-Offs.

These Regulators will reduce the high pressure in mains to that desired for use, will not pulsate and are perfectly safe to be placed in buildings, as there is no escape of gas.

These Stop-Offs automatically shut, when the supply of gas in the main has been stopped from any cause. [SEND FOR CIRCULARS.]

1860.

1886.

THE TIFFT ENGINES AND BOILERS.

Honest, Reliable and Economical. Over 7,000 in use.

Superior in finish and completeness to all others. Prices as low as any standard machinery.

Address,

Geo. W. Tift, Sons & Co.,

BUFFALO, N. Y.

Or **A. McLEAN**, General Manager, Branch Office, Bradford, Pa.

AMERICAN STEAM LAUNDRY

GODFREY & HUNT., Proprietors.

WORKS NOS. 9 TO 17 BISHOP STREET.

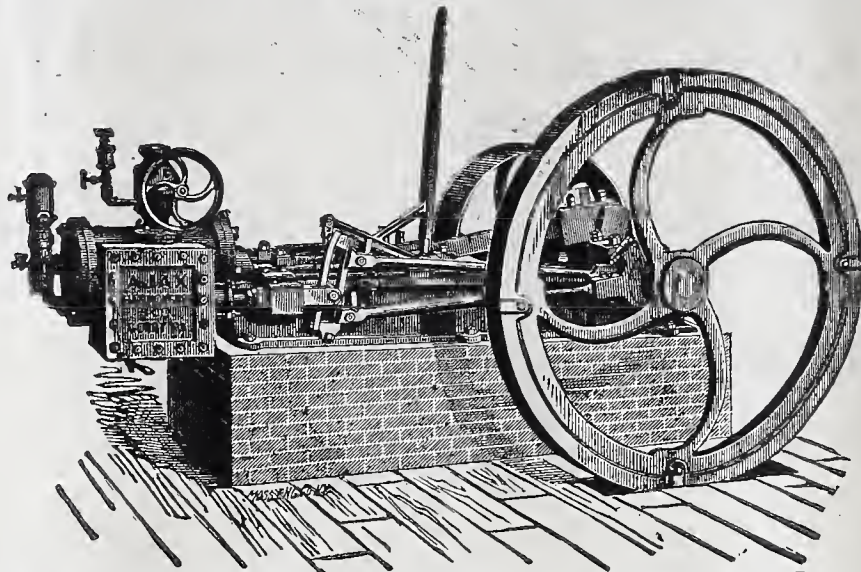
OFFICE 55 MAIN ST.,

BRADFORD, PA.

TELEPHONE.

DELIVERY WAGONS.

THE AJAX ENGINE,



Manufactured by Harmon, Gibbs & Co.,

Is still the favorite in every field from the 400 feet wells of Grand Valley to the 3,000 feet wells of Washington. Economy in Fuel, Strength, Power, Speed and Durability are its strong points. Nearly 2,000 now in use, and you may travel from Wellsville, N. Y., to Macksburg, O., and not find one in a junk or repair shop.

We finish them in the shop and do not have to follow them into the field to make them run. Record of "Ajax" No. 1105 over 22,000 feet and still drilling.

JAMES M. LAMBING, General Agent, Corry, Pa.
OFFICE OPPOSITE PASSENGER DEPOT.

SIGNIFICANT.

"As good as the **DOMESTIC**," or "like the **DOMESTIC**," is what Competitors say when speaking of the merits of their machines, and all improvements made by the **DOMESTIC** are imitated as soon and closely as possible.

Why? Did you ever think what this means? Does it not imply in the strongest manner possible the pre-eminent excellence of the

"DOMESTIC" SEWING MACHINE,

That it is the only recognized Standard and Leader in Progress?

J. W. FRITTS, Agent.

No. 7 Kennedy St., Bradford, Pa.

Buffalo, Rochester & Pittsburgh R. R.
BUFFALO AND ROCHESTER DIVISION.

May 22, 1887.

Eastern Time.

STATIONS.							
P. M.	A. M.	P. M.	A. M.	A. M.	P. M.	A. M.	P. M.
7 15	6 20	11 00	Ar. Buffalo..	Lv	8 10	5 10	
3 16			" Rochester "			7 50	
2 30	3 30	8 00	Lv. Bradford. Ar	11 00	8 00	12 30	
6 00							
	P. M.		Ar do Lv		P. M.	P. M.	
	2 15		" Ridgway "		12 55		
	11 38				3 26		
			" Falls Creek "		4 51		
	10 14		" Dubois "		4 58		
	10 08						
	9 00		Punxsutawney		5 59		
	A. M.		Lv	Ar			

Thousand.Mile Tickets sold at Two Cents per mile.

Connections made at Salamanca with the N. Y., P. & O. R. R. for all points West and Southwest; also with the Erie R. R. for all Eastern points; at Bradford with the Narrow Gauge system to all points in the Oil Regions.

JAS. T. GARDNER, Supt. I. S. EMERY, Gen. Pass. Agt.

Warren and Farnsworth Valley Railroad.

Narrow Gauge Railroad to Garfield, Vandergrift and Dunham's Mills.

Clarendon, Lv.... 10 35 5 10 Garfield, Lv.... 7 20 3 15
Garfield, Ar.... 11 35 6 10 Clarendon, Ar... 8 20 4 15

Trains are run on P. & E. R. R. time. Passengers can leave Oil City and Titusville for Garfield by morning train, remain three and one-half hours in Garfield and return same evening.

A. D. WOOD, General Manager.

BRADFORD, BORDELL & KINZUA

AND

Bradford, Eldred & Cuba Railroad.

May 29, 1887.

WEST.		STATIONS.		EAST.	
Exp.	Mail.			Exp.	Mail.
P. M.	A. M.			A. M.	P. M.
5 20	11 50	Ar. Bradford	Lv	7 25	2 25
4 45	11 15	" Kinzua Junction	"	8 05	3 05
4 38	11 10	" McCalmont	"	8 10	3 10
4 36	11 08	" Rew City	"	8 13	3 12
4 13	10 48	" Rixford	"	8 31	3 28
4 08	10 43	" Duke Centre	"	8 36	3 33
3 50	10 25	" Eldred	"	8 55	3 50
3 32	10 10	" Bullis Mills	"	9 10	4 05
3 17	9 54	" Ceres	"	9 26	4 21
3 04	9 40	" Little Genesee	"	9 40	4 35
2 55	9 30	" Bolivar	"	9 50	4 45
2 34	9 06	" Allentown	"	10 14	5 09
2 05	8 35	Lv. Wellsville	Ar	10 15	5 40
P. M.	A. M.			A. M.	P. M.
7 30	10 45	Ar. Bradford	Lv	8 30	5 15
6 55	10 10	" Kinzua Junction	"	9 10	5 55
6 47	10 02	" Aiken	"	9 17	6 02
6 41	9 56	" Davis	"	9 23	6 08
6 35	9 50	" Simpson	"	9 30	6 15
6 25	9 40	" Ormsby	"	9 40	6 25
5 50	9 05	" Smethport	"	10 15	7 00
5 50	9 05	" Mt. Jewett	"	10 15	7 00
5 15	8 30	Lv. Kane	Ar	10 50	7 35

Sunday Train leaves Smethport at 8:25 a. m., arriving at Bradford at 10 a. m. Returning leaves Bradford at 3:30 a. m. arriving at Smethport at 5:10 p. m.

JOHN C. MCKENNA, Superintendent.

THE PETROLEUM AGE.

W. H. DUFUR, Chairman.

JAS. B. BERRY, Secretary and Treasurer.

THE ASTRAL REFINING CO.,
LIMITED.

Refiners and Producers of Petroleum,

ALL QUALITIES OF

Illuminating, Lubricating Oils, Naphthas and Gasoline,

OIL CITY, PENN'A.

Manufacturers of "Water White Astral Oil," 48 to 49 Gravity, 50 Fire Test.

J. W. McFARLAND,

BROKER IN OIL PRODUCTION.

81 MAIN STREET.

Buys, Sells and Leases all kinds of Oil Properties. In-
formation carefully given.

ADDRESS LOCK BOX 1925, BRADFORD, PA.

JAMES C. BOYCE,

ATTORNEY AT LAW,

Solicitor of Patents and Attorney in Patent Causes.

ROOM NO. 3,

Over Oil Well Supply Company, Limited.

Corner Main and Webster streets, - - BRADFORD PA.

FOR OIL OR GAS WELL PACKERS

SEND YOUR ORDERS TO

S. R. DRESSER, BRADFORD, PA.,

Who will fill them promptly with

The Best Malleable Iron Frame and Superior Quality of Rubber.

He Makes a Specialty of the Packer Business and Can Give You

Anything in that Line.

H. A. MARLIN & CO.,

PETROLEUM BROKERS

BRADFORD AND NEW YORK.

WHEELING AND LAKE ERIE

And Cleveland and Marietta R. R's.

Time Table—In effect Nov. 1, 1886.

Central Standard Time.

EASTWARD.	No. 5.	No. 7.	No. 9*	No. 1*
Toledo.....Lv	7 45a. m.	12 30p. m.	4 45p. m.	.....
Oak Harbor.....Ar	8 43	1 22	5 38	.....
Fremont.....	9 07	1 47	6 02	.....
Clyde.....	9 23	2 03	6 18	.....
Bellevue.....	9 38	2 18	6 32	.....
Monroeville.....Lv	9 57	2 32	7 01	1 35a. m.
Norwalk.....	10 13	2 50	7 20	1 50
Wellington.....	11 03	3 45	9 00	2 32
Creston.....Ar	11 52	4 33	10 45	3 15
Orrville.....Ar	12 20p. m.	5 05	11 45p. m.	3 45*
Orrville.....Lv	12 40	5 05	6 00a. m.	6 00
Massillon.....Ar	1 20	5 45	6 40	6 40
Massillon.....Lv	1 20	5 45	6 40	6 40
Bowerston.....Ar	2 55p. m.	7 35p. m.	9 40a. m.	9 40a. m.

Canal Dover.....	2 34p. m.	7 02p. m.	11 30a. m.	11 30a. m.
Newcomertown.....	3 13	7 46	12 09p. m.	12 09p. m.
Cambridge.....	4 08	8 37	1 02	1 02
Macksburg.....	5 39	.....	2 30	2 30
Marietta.....Ar	6 55p. m.	.....	3 38	3 38

WESTWARD.	No. 6.	No. 8.	No. 4.	No. 2*
Marietta.....Lv	7 00a. m.	11 00p. m.	.....	.....
Macksburg.....	8 18	12 05	.....	.....
Cambridge.....	9 52	1 27	5 30a. m.	.....
Newcomertown.....	10 47	2 20	6 20	.....
Canal Dover.....	11 30a. m.	2 54p. m.	6 55	.....

Bowerston.....	11 55a. m.	3 30p. m.	6 30a. m.	.....
Massillon.....	1 20p. m.	7 10	8 15	.....
Orrville.....Ar	1 55	8 20	8 55	.....
Orrville.....Lv	2 00	10 15*	8 55	.....
Creston.....Lv	2 30	10 45	9 25	.....
Wellington.....	3 18	11 28	10 12	*
Norwalk.....	4 10	12 10	11 25	7 25a. m.
Monroeville.....	4 22	12 25a. m.	11 37	7 37
Bellevue.....	4 40	*	11 55	7 53
Clyde.....	4 56	.....	12 10p. m.	8 08
Fremont.....	5 13	.....	12 30	8 25
Oak Harbor.....	5 41	.....	12 55	8 48
Toledo.....Ar	6 35p. m.	.....	1 55p. m.	9 45a. m.

No. 29.	No. 27.	NORWALK & HURON.	No. 26.	No. 28.
5 15p. m.	11 40a. m.	Ar.....Huron.....Lv	6 25a. m.	2 05p. m.
4 30p. m.	10 45a. m.	Lv.....Norwalk.....Ar	7 15a. m.	3 00p. m.

* Daily.

This road is now open through from Toledo to Bowerston, connecting with the Pennsylvania System for all points East.

THROUGH CAR SERVICE—Between Toledo, Cambridge and Marietta; Toledo and Bowerston; Toledo and Akron, Youngstown and Pittsburgh; Chicago, Akron, Youngstown and Pittsburgh.

M. D. WOODFORD,
General Manager.

JAMES M. HALL,
Gen'l. Pass. Agent

Philadelphia & Erie Railroad.

Time Table in Effect Nov. 15, 1886. | Eastern Standard Time.

EASTWARD.		Kane Express No. 18.	Day Express No. 8.	Erie Mail No. 4.	Kane Accom. No. 12.
Erie	Lv.	7 35 a m		2 45 p m	5 25 p m
Corry	"	9 00 "		4 13 "	7 00 "
Irvineton	"	9 52 "		5 00 "	7 50 "
Warren	"	10 08 "		5 15 "	8 05 "
Kane	Ar.	11 25 "		6 30 "	9 15 "
Kane	Lv.		6 25 a m	6 55 "	
Johnsonburg	"		6 58 "	7 30 "	
Emporium Junction	"		8 30 "	9 15 "	
Lock Haven	"		11 15 "	11 58 "	
Williamsport	"		12 25 p m	1 25 a m	
Harrisburg	Ar.		3 25 "	4 30 "	
Philadelphia	"		6 50 "	8 25 "	
WESTWARD.		Erie Accom. No. 11.	Erie Mail No. 3.	Niagara Express No. 11.	Erie Express No. 17.
Philadelphia	Lv.		11 25 p m	7 40 a m	
Harrisburg	"		3 30 a m	11 25 "	
Williamsport	"		7 10 "	2 25 p m	
Lock Haven	"		7 58 "	3 15 "	
Emporium Junction	"		10 30 "	6 25 "	
Johnsonburg	"		12 00 m	8 02 "	
Kane	Ar.		12 40 p m	8 35 "	
Kane	Lv.	6 35 a m	1 00 "		4 16 p m
Warren	"	7 45 "	1 58 "		5 25 "
Irvineton	"	7 58 "	2 09 "		5 48 "
Corry	"	8 55 "	2 56 "		6 50 "
Erie	Ar.	10 15 "	4 00 "		8 10 "

Trains daily except Sunday.

THROUGH-CAR ARRANGEMENT WESTWARD—Erie Mail—Pullman Palace Sleeping Cars Philadelphia to Erie, and Philadelphia to Williamsport (cars open to receive passengers at Philadelphia at 10 00 p m), and Washington to Williamsport. Passenger Coaches from Philadelphia to Erie, and Baltimore to Williamsport.

Niagara Express—Pullman Parlor Car Philadelphia to Williamsport.

THROUGH-CAR ARRANGEMENT EASTWARD—Day Express—Pullman Parlor Car Williamsport to Philadelphia. Passenger Coaches Kane to Philadelphia, and from Williamsport to Baltimore.

Erie Mail—Pullman Sleeper Erie to Philadelphia, and Williamsport to Philadelphia. (Car open to receive passengers at Williamsport at 9 00 p m.) Passenger Coaches Erie to Philadelphia, and Williamsport to Baltimore. Sleeping Car Williamsport to Washington.

W. & W. R. R. TIME TABLE.

DECEMBER 27, 1886.

NORTHWARD		STATIONS.	SOUTHWARD	
No. 3	No. 1		No. 2	No. 4
P. M.	A. M.		A. M.	P. M.
2 00	6 00	Lv. Wayneburg	Ar.	10 35
2 15	6 15	..... Sycamore		10 17
2 23	6 23	..... Swart		10 09
2 30	6 30	..... Deer Lick		10 02
2 38	6 38	..... West Union		9 53
2 47	6 47	..... Dunn		9 43
2 50	6 50	..... Lindley's Mills		9 40
3 01	7 02	..... West Amity		9 28
3 06	7 08	..... Lucien		9 22
3 11	7 13	..... Baker		9 17
3 14	7 20	..... McCracken		9 13
3 27	7 35	..... Vankirk		9 00
3 40	7 50	..... Braddock		8 48
3 55	8 05	Ar. Washington	Lv.	8 35
6 36	9 55	Ar. Pittsburg	Lv.	6 10
P. C. & St. L. R. R.				

Time given above is Central Standard, which is 40 minutes slower than Pittsburg or local time, or one hour slower than Eastern time.

The Company reserve the right to vary from this schedule as circumstances may require. All trains daily except Sunday.

C. E. BOWER, Superintendent.

JOHN F. STRATTON,

49 Maiden Lane,

New York.



Importer, Manufacturer and Wholesale Dealer in all kinds of Musical Merchandise, Musical Boxes, Band Instruments. Stratton's Celebrated Russian Gut Violin Strings.



The PITTSBURG & WESTERN RAILROAD Time Table.

NORTHERN DIVISION.

SOUTHBOUND TRAINS.

STATIONS.		27		17	
		P. M.	A. M.	A. M.	
Bradford	Lv.			6 00	
Mt. Jewett	Lv.			7 40	
Kane				10 10	
Sheffield Junction				11 04	19
Marienville				11 47	P. M.
Tylersburg				12 27	
Clarion Junction			6 20	1 14	4 00
Clarion			6 50	12 35	3 30
Shippenville	23		6 30	1 28	4 14
Knox			6 45	1 45	4 33
St. Petersburg	A. M.		7 24	2 30	5 20
Foxburg	5 40		7 38	3 00	5 40
Parker	5 50		7 48	3 10	
Bruin	6 08	P. M.	8 06	3 31	P. M.
Petrolia	6 18		8 17	3 45	
Karns	6 22	7	8 22	3 50	9
Millerstown	6 36		8 36	4 07	
St. Joe	6 50	A. M.	8 50	4 25	P. M.
Butler	7 18	5 15	9 30	5 25	1 55
Renfrew	7 39	5 28	9 46	5 45	2 11
Callery Junction	8 05	5 50	10 10	6 05	2 35
Allegheny	9 30	7 10	11 20	7 20	3 58
	A. M.	A. M.	P. M.	P. M.	P. M.

NORTHBOUND TRAINS.

STATIONS.		28	8	18	24	26
		A. M.	A. M.	A. M.	P. M.	P. M.
Allegheny	Lv.	3 15	9 20	7 20	12 40	5 35
Callery Junction		4 40	10 40	8 35	1 50	6 50
R. Lew.		5 02	11 00	8 55	2 13	7 12
B. Joe		5 20	11 20	9 18	2 36	7 30
St. Joe				9 45	3 08	8 00
Millerstown			A. M.	10 30	3 23	8 14
Karns				10 15	3 38	8 28
Petrolia			20	10 20	3 45	8 32
Bruin				10 32	3 56	8 43
Parker		A. M.		10 52	4 15	9 00
Foxburg		6 25		11 25	4 40	9 10
St. Petersburg			6 44	11 41	4 54	
Knox			7 49	12 32	5 40	
Shippenville			8 11	12 53	5 58	
Clarion Junction			8 30	1 14	6 10	
Clarion			9 00	1 45	6 40	
Tylersburg				1 48		
Marienville				2 26		
Sheffield Junction				3 06		
Kane	Ar.			3 58		
				4 40		
Bradford	Ar.			6 35		
		A. M.		P. M.	P. M.	P. M.

Westbound trains leave Callery Junction as follows:

Cleveland and Toledo Express 8.35 a. m., New Castle Accommodation 4.43 p. m., Chicago Express, with through Sleeping Car, 1.44 p. m., Zelenople Accommodation 6.55 p. m.

No. 17 makes direct connection at Allegheny with B. & O. R. for Washington and Baltimore.

No. 19 connects at Foxburg with A. V. R. R. for Franklin and Oil City.

SUNDAY TRAINS Nos. 23 and 26 will run daily. Nos. 18 and 17 will run daily between Butler and Allegheny. No. 23 connects at Callery Junction for Allegheny and New Castle. No. 26 gets connections from Allegheny and New Castle. All other trains run daily, except Sunday.

THOS. M. KING, General Manager.

C. W. BASSETT, General Passenger Agent.

DUNKIRK, ALLEGHENY VALLEY & PITTSBURGH R.R.

Going North.		Express No. 2.	Mail No. 4.	Sunday No. 6.
Titusville, leave		7 35a.m.	3 20p.m.	7 35a.m.
Grand Valley		8 03a.m.	3 48p.m.	8 01a.m.
Irvineton		8 45a.m.	4 36p.m.	8 44a.m.
Warren		8 58a.m.	4 53p.m.	8 56a.m.
Junction		9 55a.m.	5 45p.m.	9 48a.m.
Lily Dale		10 50a.m.	6 36p.m.	10 37a.m.
Dunkirk, arrive		11 25a.m.	7 10p.m.	11 12a.m.
Going South.		Mail No. 1.	Express No. 3.	Sunday No. 5.
Dunkirk, leave		9 25a.m.	4 00p.m.	2 40p.m.
Lily Dale		10 03a.m.	4 38p.m.	3 14p.m.
Junction		11 02a.m.	5 45p.m.	4 08p.m.
Warren		11 55a.m.	6 44p.m.	5 06p.m.
Irvineton		12 10a.m.	7 00p.m.	5 22p.m.
Grand Valley		12 58p.m.	7 49p.m.	6 12p.m.
Titusville, Ar.		1 20p.m.	8 16p.m.	6 40p.m.

THE PETROLEUM AGE.

VOL. VI.

BRADFORD, PA., JULY, 1887.

No. 6.

INDIANA'S NATURAL GAS DEVELOPMENT.

GEOLOGY OF THE GAS AREA—OBSERVATIONS OF OIL REGION CONTRACTORS AND DRILLERS ON THE FIELD.
RECORDS OF THE WELLS—THE STANDARD
AND THE HOOSIERS.

THE history of the natural gas craze in Indiana begins with the year 1885, and naturally follows in the wake of the Ohio excitement. One of the earliest wells drilled was at Union City, in Randolph county. The first gas well, according to the statement of Mr. H. R. Mathias, was located in the borough or village of Eaton, in the northern part of Delaware county, 95 miles northeast of Indianapolis, on the Fort Wayne, Cincinnati & Louisville R. R. This well was cased at a depth of 249 feet, and the top of the Trenton was found 890 feet below the surface. It was drilled 32 feet into the Trenton, and when shut in four minutes the well showed a gas pressure of 500 pounds. Besides, the gas territory of Indiana is in a southwesterly range from the Ohio section, and old-time operators would naturally go in this direction to look for an extension of the gas or oil area.

THE WABASH ARCH.

Prof. S. S. Gorby says: "The natural gas fields of Indiana—those in which gas has been found in paying quantities—all lie in an area of ancient upheaval or disturbance." In the Fifteenth Report of the Indiana Geological Survey, Prof. Gorby, who was first to make public the existence of such a disturbance in the rock formation of Indiana and named it the Wabash arch, writes as follows concerning it:

"The northern half of Indiana consists of a generally level plain, broken slightly by occasional long, low and broad ridges that form the divides between the various water courses. Almost the whole of this region is covered by vast accumulations of transported material, consisting of sand, gravel, bowlders and clay. The general term applied to this accumulated material is drift—a term which well indicates its origin. Large volumes of flowing water and immense masses of slowly moving ice are recognized as the agents that transported and deposited these vast accumulations of drift. The uninterrupted flow of great volumes of water and the continued movement of immense masses of ice through long periods of time resulted in the wearing away of large portions of the original rocks. The whole extent of these erosions is not yet known, but sufficient facts are at hand to show that in some localities the erosions have amounted to hundreds of feet. Whatever elevations occurred in the northern part of the State were leveled by advancing glaciers and flowing waters, and the sites of ancient hills and mountains are now covered by accumulations of the glacial period. But few exposures of rocks now occur throughout all that region; hence it will be seen that to accurately follow the line of upheaval, of which many evidences exist along the course

of the Wabash River from the Ohio State line westward, is a work of great difficulty. However, prominent exposures occur at many points, and the distorted and tilted condition of the strata at these outcrops plainly indicates that strong movements or disturbances occurred in the strata at a period long before the deposition of the drift. The influence of these ancient upheavals probably extended over the greater portion of Northern Indiana. The general line or axis of upheaval was from the northwest to the southeast, but the principal exposures in Indiana, from which the phenomena may be studied, are those which have been revealed by the denudations of the Wabash River, and the general direction of this river until it reaches Delphi, in Carroll county, is westerly. The same evidences of upheaval are observed in Illinois, and may be seen to some extent at Mokena, in Kankakee county, and also in the vicinity of Chicago. The line or axis may be followed northwesterly from Chicago until the volcanic regions of Lake Superior are reached. It is highly probable, as was suggested to me by Prof. S. A. Miller, the learned paleontologist of Cincinnati, Ohio, that this line or axis of upheaval is a projection of ancient disturbances which originated in the volcanic regions of Lake Superior. The tilted rocks showing the greatest evidence of disturbance are invariably those of the upper silurian formation. The gas wells of Indiana all lie in this area of ancient upheaval, and the principal ones are located at Kokomo, in Howard county; Muncie and Eaton, in Delaware county; Portland, in Jay county; Winchester, in Randolph county; Noblesville, in Hamilton county, and Marion, in Grant county. At most of the Indiana wells the Trenton limestone is struck at a depth of about 900 feet."

Prof. Edward Orton says the "Wabash arch in its larger features, if a disturbance extending to the north westward would seem to be part and parcel of the Cincinnati uplift. It seems at the present writing that the situation of the Trenton limestone in Indiana where favorable to gas production follows the line of facts already pointed out in Northwestern Ohio, namely, that gas is found in the Trenton limestone mainly when the Niagara limestone makes the surface rock. On the western and southern border of the Upper Silurian outcrop, where the entire upper limestone series is much reduced in thickness, it appears that the Trenton is found relatively high enough to serve as a gas rock when the Waterlime, or possibly even when the Devonian limestone makes the surface."

THE CINCINNATI AXIS.

In his Preliminary Report upon Petroleum and Gas, published by A. H. Smythe, Columbus, Ohio, Prof. Edward Orton says of the Cincinnati axis: By the explorations that have gone forward it has been possible to obtain a large series of facts which give us a much clearer idea of this ancient uplift than we could ever have secured without them. The fortunes of this great factor in our geology are bound up with the Trenton limestone and must be studied with reference to its history and

conditions. A part of what we have heretofore counted the results and exhibition of the uplift is found to be due to an entirely different cause, namely, to the thickening of the lower formations in certain areas. All the essential features of this uplift must be found in the disposition and arrangement of the Trenton limestone. The Trenton limestone is the Cincinnati uplift. From a map which is printed in the report, Prof. Orton makes the following observations:

1. The Cincinnati axis bears to the northwest instead of the northeast, as has been heretofore held. The highest level of the limestone passes from Point Pleasant, where it is about 470 feet above tide, through Clermont, Butler and Preble counties into Indiana, where it seems to be continued in a broad tract, the western boundary of which coincides in a general way with the western boundary of the Upper Silurian rocks of the State. The limestone maintains itself above sea level as far to the northwest as Eaton and Muncie, Delaware county. These facts seem to justify us in saying that the Cincinnati axis bears to the northwest instead of to the northeast as it leaves southwestern Ohio.

2. From this high-lying tract of the Trenton limestone there is a northeasterly prolongation or off-shoot that enters Ohio from Indiana in Mercer county and passes thence through Auglaize, Allen and Hancock counties. This has proved itself to be one of the most important divisions of the formation in northwestern Ohio, and it may well be named the *Lima axis*.

3. From the central part of Hancock county the line of highest levels of the Trenton limestone bears nearly due north but with a small westerly element appearing in its direction. This tract is bounded on its west side by the most remarkable structured feature yet developed in Ohio geology. It consists of a pronounced monoclinical fold, the descent of which is nearly 200 feet. The monoclinical passes directly through Findlay and was first revealed in connection with the gas and oil wells of that town. It may well be styled the Findlay break or the Findlay monocline. The Trenton limestone on the east side of Main street, in Findlay, at a depth of 1100 feet is found in a flat-lying tract or terrace, the upper surface of which is a little more than 300 feet below tide water. From this level the limestone descends to the west quite abruptly, falling 120 feet in 1000 of horizontal measure in at least one well known instance.

The Findlay break has not been proved to be strictly continuous to the northward, but even if there is no single monoclinical that traverses the rocks there is at least a succession of such breaks with a general northern direction that extends to the Michigan line. Van Buren, Portage, Bowling Green, Monclova and Sylvania are all on the edge of steep descents to the westward. The great gas wells are mainly located upon the eastern margin of the slopes, and their extraordinary production is explicable to an extent by the facts of their location.

EXTENT OF THE GAS TERRITORY.

What the geologists have outlined from a scientific standpoint the Pennsylvania contractors and drillers have described in the common-place parlance of the derrick. Captain Gibney, who is drilling gas wells by contract in the Hoosier State, says the gas territory of Indiana is confined to a plateau in the Trenton rock. Taking a map of the State of Indiana and locating the gas wells and failures upon it the elevated area upon which the gas wells have been found can already be roughly outlined. As now seen the northern boundary of this area is south a few miles and parallel with the Wabash River, and extends from the eastern line of the

State about 85 miles westward to Logansport, in Cass county. A line drawn from Logansport to Indianapolis will fall to the west of the known gassers. The southern boundary would not go beyond a line passing from the State capital in an easterly direction through Greenfield. It is a broad area, 85 miles in an easterly and westerly direction and 70 miles in a northerly and southerly course.

Below is a copy of a report on the wells drilled in many of the towns and cities of Indiana, made by a gentleman who has traveled over most of the State where drilling is being done for gas. The report was made on the 21st of June, and while it may be incomplete in some localities, it will be found of interest to our readers:

Town.	County.	Kind of well.	Remarks.
Elkhart.....	Elkhart.	Dry.	
Goshen.....	"	Dry.	
South Bend.....	St. Joseph.	Drilling.	Think dry.
Valparaiso.....	Porter	"	"
Warsaw.....	Kosciusko.	"	"
Warsaw.....	"	Dry.	
Columbia City.....	Whitley.	Drilling.	"
Columbia City.....	"	Dry.	"
Fort Wayne.....	Allen	Drilling.	"
North Manchester.....	Wabash.	"	
Wabash City.....	"	Dry.	
La Fontaine.....	"	Gas.	Small gasser.
Huntington.....	Huntington	Dry.	
Warren.....	"	"	
Bluffton.....	Wells.	"	
Decatur.....	Adams.	"	
Peru.....	Miami.	"	
Xenia.....	"	Gas.	Small gasser.
Logansport.....	Cass.	Dry.	
Delphi.....	Carroll.	"	
Flora.....	"	Drilling.	
La Fayette.....	Tippecanoe.	Dry.	
Frankfort.....	Clinton	"	
Russiaville.....	Howard.	"	Salt water.
Kokomo.....	"	5 wells.	Fair gassers.
Tipton.....	Tipton.	2 dry.	Claim gas in 3d well
Marion.....	Grant.	4 wells.	Fair gassers.
Marion.....	"	2 drilling.	
Jonesborough.....	"	Good gasser.	
Fairmont.....	"	Gas.	Produces in 24 hours 11,500,000 cubic ft.
Up and.....	"	Drilling.	
Montpelier.....	Blackford.	Dry.	Small gasser and some oil.
Hartford City.....	"	2 wells.	1 good gasser.
Dunkirk.....	Jay.	Fair gasser.	
Redkey.....	"	Good gasser	
Portland.....	"	several wells	Small gassers.
Ridgeville.....	Randolph.	Dry.	
Winchester.....	"	"	Very little gas.
Union City.....	Delaware.	Gasser.	Fair gasser.
Eaton.....	Madison.	Fair gasser.	
Summitville.....	"	Small gasser	
Elwood.....	"	"	
Franklin and Alexandria.....	"	Gas	Small gasser.
Anderson City.....	"	4 wells.	3 small and 1 large gassers.
Pendleton.....	"	Gas.	A little gas.
Noblesville.....	Hamilton	Good gasser.	
Zionsville.....	Boone.	Drilling.	June 21 on top of Trenton rock.
Lebanon.....	"	Dry.	
Thorntown.....	"	"	
Crawfordsville.....	Montgomery	"	
Near same place.....	"	"	
Danville.....	Hendricks.	Drilling.	
Summit Station.....	"	"	
Indianapolis.....	"	Dry.	
Greenfield.....	Hancock.	Some gas.	
Newcastle.....	Henry.	Dry.	
Spiceland.....	"	Drilling.	
Richmond.....	Wayne.	Dry.	
Rushville.....	Rush.	"	
Greensburg.....	Decatur.	Drilling.	
Bloomington.....	Monroe.	Dry.	
Francisville.....	Pulaski.	Little oil.	
Fortville.....	Hancock.	Rig.	
Swayzee.....	Grant.	"	
Lawrence.....	Marion.	Drilling.	Used 115 feet drive pipe.
Haughville.....	"	"	Two charters.
Westfield.....	Hamilton.	Dry.	
Cicero.....	"	Drilling.	
Between Noblesville and Cicero.....	"	5 wells.	Owned by Standard Oil Co. fair gassers
Yorktown.....	Delaware.	Drilling.	
Muncie.....	"	7 wells.	1 is dry, 1 good well, rest fair gassers.
Albany.....	"	Fair gasser.	

RECORDS OF THE WELLS.

Among the first of the contractors from the Pennsylvania oil regions to start the drill in Indiana were Laney & Churchill, of Bradford. From Mr. Laney, who is an

experienced and thoroughly practical man in his field operations, the following particulars were learned concerning the wells which Laney & Churchill have put down in the Hoosier State:

The first well is located on South street, Indianapolis, and was finished in February, 1886. To reach the bed-rock 70 feet of drive pipe was used. The well was cased at 410 feet, and the Trenton limestone was struck at a depth of 920 feet. The drill was stopped 1508 feet below the surface. No gas was found, but water was struck at 1000 feet, 1500 feet and 1508 feet. The well was owned by the Indianapolis Natural Gas Co., who have about 10,000 acres of land leased between Indianapolis and Greenfield and Noblesville.

KOKOMO'S GAS WELLS.

Laney & Churchill drilled three wells at Kokomo for the Kokomo Natural Gas Co., a company made up of citizens of the place. The Kokomo No. 1 was started in the Niagara limestone, no conductor being used. It was cased at 434 feet and the Trenton rock tapped at 910 feet. The gas was found in the first 10 feet, and a little water was found further in the rock. The Kokomo Dispatch of January 27 has the following on the three gas wells then producing at Kokomo:

"On October 7, 1886—only three months ago—natural gas well No. 1 was drilled in at Kokomo at a depth of 915 feet. The confined pressure in a 2-inch pipe was 120 pounds in two minutes, with a flow of 4,000,000 cubic feet of gas every 24 hours.

"On December 17, 1886, well No. 2 was developed at a depth of 916½ feet, yielding a flow of 5,000,000 feet per day. The exhaust pressure through a 2-inch open tube was 12 pounds to the square inch.

"On December 29, 1886, well No. 3. was drilled in at a depth of 914½ feet. The pressure through a 2-inch open tube was 15 pounds, and 120 pounds in 1½ minntes under confinement. The flow from this well is 6,000,000 cubic feet per 24 hours.

"The three wells yield a combined flow of 15,000,000 cubic feet of natural gas every 24 hours."

Mr. Laney says the record of No. 2 is practically the same as No. 1. The well was started on the limestone and the Trenton was struck at a depth of 905 feet. and the well gassed heavily at 916½ feet. The well was drilled to a depth of 924 feet. An explosion took place at this well, causing the rig to be burned and the tools to fall to the bottom of the well.

Mr. John T. Stringer, Secretary of the South Kokomo Gas Co., furnished the following record of the Kokomo No. 3:

	Feet.
Drift.....	5
Limestone.....	400
Hudson River and Utica shale.....	498
Trenton Limestone.....	4
Total in Trent on after striking gas.....	5

Depth of well.....912

The No. 3 was drilled into the Trenton on December 28, 1886, and at that time was estimated to have a yield of 4,000,000 feet per day. No. 3 was a small well until it was shot with 60 quarts of glycerine.

The fourth well drilled at Kokomo by Laney & Churchill was owned by the Junction Co. and was situated near Nos. 1 and 2. No conductor was required at this well and it has about the same record as Nos. 1 and 2.

Prof. S. S. Gorby, Assistant State Geologist, furnishes the following record of the first three wells drilled at Kokomo:

	No. 1. Feet.	No. 2. Feet.	No. 3. Feet.
Drift.....			5
Niagara limestone.....	285	284	280
Clinton limestone.....	20	20	20
Hudson River group.....	525	530	530
Utica shale.....	50	40	50
Trenton limestone.....	40	42½	27
Total.....	920	916½	912
Below sea level.....	95	91½	62
Top of Trenton below sea level.....	55	49	35

The Kokomo Natural Gas Co.'s No. 5 reached the Trenton limestone June 22, 1887, at a depth of 898 feet, and the drill was stopped on the following day at 915 feet. As usual this well is reported to be the largest well in the State.

The Kokomo Dispatch of June 23 gives the combined flow of these five gas wells as 30,000,000 cubic feet, and says that the city is completely piped, over 15 miles of mains having been laid.

The Dispatch of June 30 devoted two columns of its space to the great gasser on the Fred Shrader farm and calls it "The King of gas wells." The Board of Directors presented the contractor, Ed. Sweeney, with an order for a \$40 suit of clothes on the completion of the well. The editor of the Dispatch evidently had inhaled a large amount of gas, or imbibed something in liquid form, before he pencilled the following on the new gasser:

"Only during the bustle and noise of the busy hours is the constant roar of the freed monster unheard, even in the heart of the city. About the quieter suburbs its hoarse voice is never silent. Alighting from the night trains at the upper railway stations, the first thing that greets the visitor's ear, after the din of puffing engines is hushed, is a steady, rumbling sound, like the near approach of a heavily laden train of cars. So complete is the illusion that he instinctively turns and glances down the track, expecting to see the flashing headlight of the coming locomotive. Instead, he beholds far away on the dark southern horizon a bright reflection, steady and undiminishing as the boreal lights, for which, indeed, but for the season and its southerly location, it might be mistaken. He is quite three miles away from the Great Five, and it is said that twelve miles further to the northward the effect is not materially changed. Mounting a hack he is driven southward through the city, crossing the river by the Union street bridge. The reflection on the heavens gathers and spreads, mounting upward and upward like the burning of a hundred hay-ricks against an autumn sky. The sullen roar has increased to the load, hoarse moan of an approaching hurricane sweeping through a distant forest. The rattling of the lumbering hack over the stones is no longer heard, and the passenger makes a trumpet of his hand to address the driver, as one on ship-board in a storm. The summit of a hill is reached. Through the entwined boughs of trees a seething lake of fire is seen, while great tongues of flame leap skyward, seeming to lick the overhanging clouds. The noise now is like that of a mountain cataract, rushing with the volume of a Niagara. No one attempts to speak; that would be useless. A turn in the road to the east opens a panorama of sharp contrasts. To the right miles of fields, the golden color of their garnered grain heightened in the unnatural light; red-roofed barns, vine-clad cottages, great white farm houses; the frightened cattle, unaccustomed to the new intrusion on their sleeping hours, huddled together in dumb fear. To the left the roaring, blazing, quaking disturber of this pastoral quiet, making the very earth tremble with its unpent might and paling the harvest moon to an ineffectual star by its dazzling brilliancy."

OTHER SECTIONS.

The Bridgeport well, 9 miles west of Indianapolis, was

drilled in May, 1887, by the Indianapolis Natural Gas Co. Laney & Churchill were the contractors. They put in 145 feet of drive pipe and cased the well at a depth of 515 feet. The Trenton was reached at 1150 feet and the drill stopped at 1210. The well had no gas, but found a little water.

Broad Ripple, a small hamlet located at the junction of the Indianapolis Canal with the White River, seven miles north of the city, has a small gas well owned by the Indianapolis Natural Gas Co. The contractors furnish the following record: Amount of drive pipe used, 60 feet; cased at 350 feet, and reached the Trenton rock at 860 feet; stopped drilling at 900 feet. It is a light gasser and was torpedoed with 60 quarts of glycerine. The well was completed in May, 1887.

The *Westfield* well, on the Air Line R. R., 20 miles north of Indianapolis, in Hamilton county, was sunk by the Indianapolis Natural Gas Co. Laney & Churchill were the contractors. At this well they put in 248 feet of drive pipe and cased the well at a depth of 540 feet. The Trenton rock was reached at 1040 feet, and the well was abandoned as a failure at 1080 feet. No gas was obtained, but volumes of sulphur water, called Blue Lick water in the Hoosier State.

The *Plainfield* well on the T. H. & I. R. R., 14 miles west of Indianapolis, had no gas, but showed a little water. At this point they used 145 feet of drive pipe and 620 feet of casing. The Trenton was reached at 1199 and drilling stopped at 1386 feet. It was completed in June, 1887.

The well on the Harris farm, about 11 miles north of the centre of the city of Indianapolis, is an important one to the city. It was completed in June, was torpedoed with 60 quarts of glycerine and is a good gasser. The bed-rock was found at a depth of 60 feet and the well was cased at 300 feet. The Trenton lies 853 feet below the surface and was penetrated to a depth of 31 feet, making the well 884 feet deep.

The well at Delphi, Carroll county, is a long ways northeast from Indianapolis. A citizens' oil and gas company anchored its cash in the venture and failed to find gas or oil. The contractors were Laney & Churchill. They started the drill at the surface in the Niagara limestone and cased the well at 570 feet. The Trenton was reached at 860 and the bottom of the well is 1060. The hole was full of water most of the time the well was being drilled.

Laney & Churchill are sinking a well for a citizens' gas company at Greencastle, in Putnam county. They used 60 feet of drive pipe and cased the well at 720 feet.

At Terre Haute, in the western part of the State, the Trenton limestone is getting further below the surface. Laney & Churchill, the contractors, report progress on the well as follows: The amount of drive pipe required to reach the bed-rock was 140 feet. The top of the Niagara limestone is 720 feet below the surface. The well was first cased 970 feet and water was again struck at 1540 feet, requiring the well to be cased at 1600 feet. The Trenton at this point is expected at 1750 feet.

The Irvington Natural Gas Co. completed a well June 27, which failed to show the existence of the fuel vapor, at a point five miles east of the city limits of Indianapolis. Gibney, Burnham & Morgan, the contractors, furnished the following record of the well: They put in 123 feet of drive pipe and 425 feet of casing. The Trenton rock was struck at a depth of 961 feet and the drill stopped 1023 feet below the surface. The same parties will drill a well at Cumberland, east of Irvington.

Gibney, Burnham & Morgan are drilling a well in the

southern part of the city, on Wisconsin street. They have a rig up for a well in the city south of the one on Wisconsin street, which they will sink for the Meridian Street Natural Gas and Mining Co.

The Indianapolis Natural Gas Co. has 10,000 acres of land leased between Greenfield and Noblesville, and some of this area is likely to afford wells that will rank with the best ones owned by the Standard. At any rate they are sure to get more wells like the one on the Harris farm. With an abundance of gas within 25 miles of the city it is useless to pay gilt-edged rates when the pent-up energy of a Western city is allowed free play in developing a home enterprise.

The well at Fairmont was purchased of the home natural gas company of the town for \$5000 by L. H. Best for John Satterfield, of the Union Oil Co. The well is about midway between Fort Wayne and Indianapolis. The public is at a loss to know what Mr. Satterfield will do with the roarer, but as he rarely invests in an elephant, it will no doubt contribute to the good and comfort of the people of Indiana and add to the wealth of its purchaser.

From \$50 to \$100 per year is paid to the farmers for the rental or use of a gas well by the different companies.

The price for drilling a well varies from \$1500 to \$2000, the contractors furnishing machinery and rig. When the well is completed the contractor removes the rig and machinery and the casing. If the well is a good one he sells the casing to the company. An extra charge is made for tubing and packing a well.

Mr. I. N. Hoadley, who has made a tour of the Indiana gas fields and packed some of the best wells in the field, said the rock pressure of the wells, *i. e.*, the pressure when they are shut in, would range from 340 to 375 pounds. It is a common thing for the best wells in the deep territory of Pennsylvania to show a pressure of 600 pounds.

THE STANDARD AND THE HOOSIERS.

The State of Indiana has a length in a northerly and southerly direction of 276 miles and a width of 140 miles, comprising an area of 33,809 square miles, or 21,637,760 acres. The State is divided up into 92 counties and had a population in 1880 of 1,978,362.

Months ago it was currently reported that the Standard had divided the gas territory of Indiana in to districts and placed a number of experienced men from the oil region in charge of them. Among all the cities and towns of the State the Standard people seem to have focused their attention on the teeming inland city of Indianapolis. But up to date their wells, 22 miles north of the city, are shut in and their owners are shut out of the capital. In fact, Mr. C. N. Payne, who is general manager of the Standard's gas interests, cannot agree with the city authorities on an adjustment of rates. Out on the prairies the efficient general manager is called Colonel Payne by the people who found themselves in a delightful muddle in their endeavor to understand his "mixers." The city even requires a bond of gas companies who lay gas pipe through its streets. Colonel Payne succeeded in getting this bond reduced from \$50,000 to \$10,000. The following, clipped from the Indianapolis *News* of June 7, is the Standard's schedule of prices and the ordinances regulating the gas business as they wished to have them amended:

In consideration of the use of the streets, avenues, lanes and public grounds of the city, and for the granting of this franchise, all corporations, firms and individuals availing themselves of the right under this ordinance shall, as a condition to the exercise of the franchise herein granted, furnish natural gas to the consumers for

and at the schedule of prices following. For domestic purposes the maximum prices shall not be more than 25 per cent. higher than the following schedule:

FOR HEATING.			
No. 7 Mixer.	Per Month.	No. 5 Mixer.	Per Month.
1st mixer.....	\$4 50	1st mixer.....	\$3 50
2d mixer.....	4 00	2d mixer.....	3 00
3d mixer.....	3 50	3d mixer.....	2 50
4th mixer.....	3 00	4th mixer.....	2 00
5th mixer.....	2 50	5th mixer.....	1 50
6th mixer.....	2 00	6th mixer.....	1 25

ANNUAL CONTRACTS.			
No. 7 Mixer.		No. 5 Mixer.	
	Per year.		Per year.
1st mixer.....	\$27 00	1st mixer.....	\$21 00
2d mixer.....	24 00	2d mixer.....	18 00
3d mixer.....	21 00	3d mixer.....	15 00
4th mixer.....	18 00	4th mixer.....	12 00
5th mixer.....	15 00	5th mixer.....	9 00
6th mixer.....	12 00	6th mixer.....	7 50

SMALL ROOMS AND SPECIAL PURPOSES.

No. 3 Mixer.			
November to May.		May to November.	
	Per Month.		Per Month.
1st mixer.....	\$2 00	No. 7 mixer.....	\$1 50
2d mixer.....	1 50	No. 5 m xer.....	1 25
		No. 3 mixer.....	75

Large cooking range, from November 1 to May 1—No. 9 mixer, monthly charges, \$3. From May 1 to November 1, No. 9 mixer—monthly charges, \$2. Laundry, from November 1 to May 1, No. 5 mixer—monthly charges, \$1. From May 1 to November 1, No. 5 mixer—monthly charges, \$0.75.

FURNACES.

Fire Pot.	Monthly charges.	For six months.
21-inch "A" mixer.....	\$ 6 25	\$37 50
24-inch "B" mixer.....	7 20	46 80
26-inch "C" mixer.....	8 50	51 00
28-inch "D" mixer.....	9 00	54 00
30-inch "E" mixer.....	10 00	63 00
35-inch "F" mixer.....	12 00	75 00

Half-rates on grates and open stoves only shall be charged in case where boilers and furnaces are used for heating the same room in which such grates and stoves are situated.

For manufacturers and all others not included in the foregoing schedule, natural gas shall be supplied and furnished by special agreement and at the same rate to all, whether they be large or small consumers; and in no case shall preference be given in price by the furnisher to one customer over another in the same general business. The Common Council and Board of Aldermen shall not revise the rules and fines herein established, nor shall said city enter into any competition with any corporation, company, firm or individual availing itself or himself of the provisions of this ordinance in furnishing natural gas to consumers in said city for the period of ten years from the date of the passage of this ordinance.

In all annual contracts made between the furnisher and consumer, no charges shall be made between the 1st of May and the 1st of November where the gas is used for domestic heating purposes.

To a community which has been measuring fuel by the ton and the cord this schedule is practically incomprehensible without explanation in detail. A mixer is a contrivance (furnished by the company) for mixing air with gas. It is attached to each stove, grate or furnace, and the sizes indicate the amount of gas that it permits to be consumed. The No. 5 consumer is the one used for ordinary domestic purposes. With a No. 5 in use the schedule means that the first fire (domestic heating purposes) will cost \$3.50 per month; second, \$3, etc. Annual prices are no cheaper than monthly, as fires are only required about six months, and the annual price in each instance above will be found to be six times the monthly rate.

In the above schedule the words "nor shall said city enter into any competition with any corporation, company, firm or individual availing itself or himself of the provisions of this ordinance in furnishing natural gas to consumers in said city for the period of ten years from the date of the passage of this ordinance" is hazy and mildly vague, but it has a meaning and means an exclusive right to the Standard in the city for ten years.

At a meeting held June 10 Mr. Mansfield, who has charge of the Standard's gas business in the State of Indiana, explained the capacity of their mixers, which, according to the report in the *News*, is as follows: Their No. 5 mixer under a pressure of $4\frac{1}{2}$ ounces will take about 500 cubic feet of gas in 24 hours, and the No. 7 mixer 700 to 800 feet and No. 3 from 300 to 400 feet.

The meters of the Bradford Gas Light and Heating Co. correspond to the mixers of the Standard, but they are classified by the size of the aperture through which the gas passed rather than by numbers. According to the experiments of a Bradford expert a one-eighth meter or mixer under a water pressure of three inches or one and seven-tenth ounces will take 44 feet of gas per hour or 1056 feet in 24 hours. This meter, which corresponds with the Standard's No. 5 mixer, will take or allow to pass through it when under a water pressure of six inches or three and four-tenth ounces 63 cubic feet of gas per hour or 1512 feet in 24 hours. Under the same water pressure a No. 7 meter will take 60 feet per hour for a water pressure of three inches, and 78 feet per hour for a water pressure of six inches. The Standard people charge 20 cents per 1000 feet for gas in Buffalo after piping it 94 miles, and propose to charge the same price for piping it 22 miles to Indianapolis. The price for natural gas in Pittsburgh for domestic purposes is less than 7 cents per 1000 feet when the amount paid per month is divided by the quantity used.

OIL REGION CHRONOLOGY.

FOR JUNE, 1887.

June 1.—AGE oil report shows 146 wells completed in May, of which 36 are dry; new production, 3182 barrels; new rigs, 81; old rigs, 107; wells drilling, 161; total field operations, 349; decrease from April, 7. Lima reports 28 wells completed in May and an average daily production of 14,000 barrels. Findlay reports 16 wells finished in May, with an estimated yield of 1355 barrels. Market opened at $63\frac{3}{8}$ c, rose to $63\frac{1}{2}$ c, declined to $62\frac{3}{8}$ c and closed at $62\frac{5}{8}$ c. Carrying rates, 35@40c. Gas in fair quantities reported to have been struck at Cincinnati. Woodburn well gauged 225 barrels last 24 hours. An oil strike reported at Brownsville, Pa., by the Home Natural Gas Co. Charles Dunlap falls from a derrick on the Barnhart farm, Butler county, and receives fatal injuries.

June 2.—Market opened at $62\frac{3}{4}$ c, firmed up to $62\frac{7}{8}$ c, broke to $62\frac{3}{8}$ c, fluctuated within $\frac{1}{4}$ of a cent all day and closed at $62\frac{5}{8}$ c bid. Reibold—Burchfield, Behm, No. 2, strikes a vein of salt water and declines to 25 barrels an hour. Phillips No. 3, Galebaugh, made 900 barrels last 24 hours. Murphy well, 2027, Elk, shot and made small flow. Commencement exercises of the Bradford High School; 11 graduates.

June 3.—Market opened at $62\frac{3}{4}$ c, advanced to $63\frac{1}{4}$ c and closed at $63\frac{1}{8}$ c. Reibold—Phillips No. 1, Stewart, 10 feet in sand and showing for dry hole. Solar No. 25, Shannopin, reported a failure. Burglars enter King & Lee's store, Franklin, and are fired upon by the police; no one hurt nor captured. Jefferson Clark, of Jamestown, drowned at Salamanca.

June 4.—Market opened at $63\frac{1}{8}$ c, advanced to $63\frac{1}{2}$ c and closed at $63\frac{1}{8}$ c. Carrying rates—New York and Pittsburgh, 40c; Oil City, 35c; Bradford, $37\frac{1}{2}$ c. Reibold—Phillips No. 2, Dombart, through sand and dry. Washington—Gordon No. 7 through sand and made 35 barrels the first 24 hours. Dr. Jackson, of Oil City, has his horse killed by an engine on the N. Y., P. & O. R. R. and narrowly escapes serious injury. Lima—Fee No. 3, Ridenour farm, which had dropped to 400 barrels a day, shot with 40 quarts and starts up at 115 barrels per hour. E. Alexander and Z. Blome visit Schultze well, near Wilcox, and accidentally fire the tank of oil; the rig burned down and both men were terribly burned.

June 5.—Sunday.

June 6.—Market opened at 63 $\frac{1}{8}$ c, advanced to 63 $\frac{1}{4}$ c, then declined slowly and closed at 62 $\frac{3}{8}$ c bid. Washington—Barre No. 6 struck by lightning and burned with one 250-barrel tank. The same stroke fired tanks at Barre 5 and Willetts 9; damage not heavy. F. C. Habel, a treator at the Astral refinery, killed while asleep on the A. V. R. R. track, between Astral and East Sandy.

June 7.—Market very dull; opened at 62 $\frac{5}{8}$ c, rose to 62 $\frac{3}{4}$ c, dropped off to 62 $\frac{1}{4}$ c and closed at 62 $\frac{1}{4}$ c bid. Carrying rates, 35@45c. Bradford clearances only 254,000 barrels. Reibold—Phillips No. 2, Stewart farm, down and dry.

June 8.—Market opened at 62 $\frac{3}{8}$ c, advanced to 63 $\frac{1}{8}$ c and closed at 62 $\frac{7}{8}$ c bid. Pittsburgh & Western Railroad sold to Anthony J. Thomas, of New York, for \$1,000,000. The heavy firms that control the lands at Taylorstown consolidate their interests with a view to restricting drilling in that field. Findlay begins its great gas jubilee.

June 9.—Market opened at 63 $\frac{1}{8}$ c, advanced to 63 $\frac{1}{2}$ c with a few fluctuations, declined to 63c and closed at 63 $\frac{1}{4}$ c. Morrison & Co.'s well in Centre township, 4 $\frac{1}{2}$ miles northwest of Butler, reported full of oil and gassing freely, causes some local excitement. Woodburn well, Taylorstown, doing 225 barrels. Findlay illuminated with natural gas and the celebration scores a grand success; banquet speeches by Senator Sherman, Governor Foraker and Farmer Dean.

June 10.—Market opened at 63 $\frac{1}{4}$ c, declined to 62 $\frac{3}{4}$ c, rallied to 63 $\frac{1}{8}$ c and closed at 63c. Blayne No. 2, Taylorstown, completed and good for 200 barrels a day. Prof. Myers makes a balloon ascension with natural gas at Erie.

June 11.—Market opened at 63 $\frac{1}{8}$ c, advanced to 63 $\frac{3}{4}$ c and closed at 63 $\frac{1}{4}$ c; New York closed noon at 63 $\frac{1}{2}$ c. Washington gauge, including Taylorstown wells, 7361 barrels from 187 producing wells. Seven wells at Taylorstown gauge 908 barrels. Reed well, Welsh lot, through Gantz sand and doing 90 barrels a day.

June 12.—Sunday.

June 13.—Market opened at 63 $\frac{3}{4}$ c, moved up to 64 $\frac{1}{8}$ c, declined and closed at 63 $\frac{3}{8}$ c. Well on the Sherrick farm, near Findlay, made 1100 barrels in 20 hours. Lewis Hartz, of Olean, killed by the explosion of a load of empty nitro-glycerine cans which he was driving to Gallagher Bro.'s torpedo works.

June 14.—Market opened at 63 $\frac{3}{8}$ c, advanced to 63 $\frac{1}{2}$ c, weakened to 62 $\frac{1}{2}$ c and closed at 63c bid. Wheeling Natural Gas Co.'s well, on Hamilton farm, Taylorstown, comes in a big gasser. Donehey well three bits in the sand and doing 150 barrels a day. Convention of Venango county Prohibitionists at Franklin and a full county ticket placed in the field.

June 15.—Market opened at 63c, declined to 62 $\frac{3}{4}$ c, advanced to 63 $\frac{1}{8}$ c, weakened off to 62 $\frac{1}{4}$ c and closed at 63 $\frac{5}{8}$ c. Reibold—Phillips, Behm, No. 2, in sand with small showing. Galebaugh No. 1 started at 17 barrels an hour.

June 16.—Market opened at 62 $\frac{5}{8}$ c, advanced to 63c and closed at 62 $\frac{7}{8}$ c. Well at Zoar, N. Y., reported to have 1300 feet of oil in it. Reibold—Behm No. 2 starts at 100 barrels a day. No 1 10 feet in sand with no oil. Field production, 4240 barrels from 66 wells. Donehey well, Taylorstown, doing 225 barrels a day. Workman No. 3, Washington, 18 feet in the sand with small showing. Pike Run well down and dry. Findlay, O.—Sherick Oil Co.'s No. 7 gauged 1500 barrels last 24 hours.

June 17.—Market opened at 63 $\frac{1}{8}$ c and closed at 62 $\frac{7}{8}$ c. Reibold—Phillips, Stewart, No. 3, 6 inches in sand and

doing 15 barrels an hour. Galebaugh No. 1 20 and No. 3, 35 barrels an hour. Behm No. 1 dry. Findlay—Sherick well down to 500 barrels a day. Fee well, Ridenour farm, Lima, doing 50 barrels an hour. Mail train on Pennsylvania road run from Altoona to Pittsburgh with crude petroleum as fuel. Geo. Wuster's brewery and three residences burned at Oil City; loss \$10,000.

June 18.—Market opened at 62 $\frac{7}{8}$ c, with a single sale at 63c, and closed at 62 $\frac{3}{4}$ c. Very little business. Smith, Odell & Co.'s No. 3, Johnson, at Kinzua Village, starts at 400-barrel rate. Reibold—Phillips No. 3, Stewart, drilled deeper and increased to 60 barrels an hour. Washington—Union No. 3, Workman, showing for moderate well; made 50 barrels first 24 hours. Production 7085 barrels from 190 wells. Market stood at 62 $\frac{7}{8}$ c all the day at Pittsburgh. John W. McGinnett, a driller, killed while walking on the P. & E. R. R. near Pittsfield.

June 19.—Sunday. Tidewater tank No. 5, at Coryville, McKean county, struck by lightning and burned with 25,000 barrels of oil. Phillips, Stewart, No. 3, doing 45 barrels an hour. Mattern well at Bully Hill, Venango county, burned with one tank of oil, pumping rig, boiler house, etc.

June 20.—Market still very quiet; opened at 62 $\frac{7}{8}$ c, moved up slowly to 63 $\frac{3}{8}$ c, declined to 62 $\frac{7}{8}$ c and closed at 63c bid. Odell, Smith & Co.'s No. 3, Johnson, at Kinzua Village, drilled deeper and flowing at 1000-barrel rate. J. C. Lineman loses two 600-barrel tanks of oil by lightning at Lima.

June 21.—Market opened at 63c, declined to 62 $\frac{7}{8}$ c, advanced to 63 $\frac{1}{8}$ c and closed at 63c. Price of Lima oil reduced to 20 cents a barrel. Washington—Smith No. 7 struck by lightning and burned. McKeown, Martin, No. 4, starts at 15 barrels an hour. Reibold—Phillips, Stewart, No. 3, 80, Galebaugh No. 4, 30 barrels an hour. Nine wells at Taylorstown doing 1200 barrels a day. Miller well, Frederick farm, Lima, starts at 50 barrels an hour. Lightning burns up a small tank of oil at Petroleum Centre and demolishes several rigs in the heavy oil district, near Franklin. Death of Frank Riddlesperger, of Stoneham, from injury received two weeks ago by block falling from top of derrick.

June 22.—Market opened at 62 $\frac{7}{8}$ c, advanced to 63 $\frac{1}{8}$ c and closed at 63 $\frac{1}{8}$ c bid. Johnson No. 3, at Kinzua Village, doing 55 barrels an hour. Phillips, Stewart, No. 3, Reibold, drilled deeper and responds with 52 barrels an hour. Licenses expire in Warren county and all saloons and bars closed.

June 23.—Market opened at 63c, broke to 62 $\frac{1}{8}$ c, advanced to 62 $\frac{1}{2}$ c and closed at 62 $\frac{1}{8}$ c. Washington—McKeown, Martin, No. 4, increased to 75 barrels an hour. Pittsburgh Oil Co. find a small well at Slab Furnace, Venango county, in the Red Valley sand.

June 24.—Market opened at 62 $\frac{1}{8}$ c, sold off to 60 $\frac{3}{4}$ c, advanced and closed at 61 $\frac{3}{8}$ c. Carrying rates—Bradford 35c, Oil City 37 $\frac{1}{2}$ c, Pittsburgh 40c, New York 50@60c. Albert well, Centre township, Butler county, acknowledged dry. Phillips Bros., Ehrman farm, down and dry. McKeown, Martin, No. 4, Washington, increased by deeper drilling to 120 barrels an hour. Stewart No. 3, Reibold, 40 barrels an hour. Gauge of Reibold field, 6033 barrels from 70 wells.

June 25.—Market opened at 61 $\frac{3}{8}$ c, advanced to 61 $\frac{1}{2}$ c, to 61 $\frac{1}{4}$ c, rallied to 61 $\frac{3}{8}$ c and closed at 61 $\frac{1}{2}$ c. Carrying—Bradford 35c, New York 65c, Oil City 33@40c, Pittsburgh 45c. Washington—Production of Martin No. 4 for 24 hours ending this morning, 2800 barrels; field gauge, 9854 barrels from 190 wells. Boiler at Standard refinery,

Lima, explodes, wrecking the engine house and injuring Fireman Myers.

June 26.—Sunday. Great excursion of 600 people from Oil City, Titusville, etc., to Bradford and Kinzua Bridge. Excursions from Bradford to Charlotte, Niagara Falls and the Big Bridge.

June 27.—Market opened at 61½c, declined to and closed at 61¼c. Carrying rates—New York 60@65c, Bradford and Pittsburgh 35c, Oil City 37½@40c. Reibold—Phillips, Behm, No. 5, starts at 15 barrels an hour from the 100-foot. Stewart No. 3, 30 barrels an hour. Washington—Martin No. 4, 100 barrels an hour. The 3-year-old son of Martin Hauckman, of Olean, drowned at Eldred. Death of J. E. McCarter, a widely-known broker of the Oil City Exchange.

June 28.—Market opened at 61¼c, sold off to 60½c, rallied to 62¼c and closed at 62¼c. Carrying rates 35@45c. Reibold—Root & Johnson, Blakeley, No. 2, 18 barrels an hour; Phillips, Behm, No. 5, 12; Stewart No. 3, 30 barrels an hour. Washington—Martin No. 4, 100 barrels an hour. Workman No. 3 through 50-foot sand without oil. Paola, Kansas, holds a natural gas celebration. Employes of National Transit Co. give a grand picnic at Slippery Rock Park, Butler county; 1500 people of the lower oil region attend. Indignation meeting of Jamestown citizens protesting against the action of Governor Hill in allowing the bill to bond the city for a gas charter to become ineffective without his signature. Ohio oil producers hold a meeting and discuss the situation with pipe-line officials. Slaughterbeck No. 2, North Baltimore, filled two 600-barrel tanks first 24 hours.

June 29.—Market opened with sales at 62¼c, sold down to 61½c, advanced to 62¼c and closed at 61¾c. Washington—McKeown, Martin, No. 4, 95 barrels an hour. Reibold—Phillips, Behm, No. 3, 40 feet in sand and no good. Lima producers adopt resolutions favoring a nine months' shut-down. Judge Brown refuses to entertain any license applications for Warren county. Death of Joseph R. Morse at Prentissville, a prominent operator of the Bradford and Kinzua fields. McCoy nitro-glycerine factory, four miles west of Findlay, destroyed by an explosion. Several tramps believed to have been killed. A firecracker causes a \$5000 fire at Jamestown.

June 30.—Market opened at 61½c bid, with sales at 61¾c, sold off and closed at 61¾c. Carrying rates 40c. Washington—McKeown, Martin, No. 4, 90 barrels an hour. Dyer wildcat, at Bakertown, dry in 50-foot and shut down. The two wells at Cannonsburg are doing 15 and 5 barrels a day respectively. Boiler at Mt. Morris well, Greene county, explodes; no one injured. Extremely hot weather throughout the region.

The Average Price of Crude.

The following table gives the average price of crude certificates, on the floor of the Bradford Oil Exchange, since March 1, 1879:

MONTH.	1879	1880	1881	1882	1883	1884	1885	1886	1887
January	110 1-5	95	83	92½	111¼	70¾	88¼	71	
February	103¼	89¼	85¼	101	104¾	73¼	80	63¾	
March	86	89	82¾	80¾	97½	100¾	80¾	77½	63¾
April	78¾	76¾	84¾	78¼	92¾	94	78¾	74	64½
May	73½	80¼	81¾	70	99¾	85½	79¾	69¾	64
June	68¾	100¼	81	54½	117¼	68¾	82¼	67	62¾
July	69¾	101¼	76¾	57¾	108	63½	96¾	66	
August	67¼	90¾	78¾	58¾	108¾	81 1-5	100¾	62	
September	69¼	95½	92¼	71¾	112½	78	100¾	63¾	
October	88¼	96¾	92¾	93¾	111¾	71	105¾	65¾	
November	105¾	91¼	82¾	114¾	114 4-5	72½	104¾	72	
December	113¼	92¾	83¼	95¼	114¾	74¾	89¾	71	

THERE are 20 wells producing oil in Fremont county, Colorado.

The Macksburg Field in June.

The production of the Macksburg field, estimated from the pipe line runs, the shipments of the West Virginia Transportation Company, etc., averaged about 229 barrels a day for 1884. The gross runs of the Macksburg pipe line since January 1, 1885, with the estimated amount of oil shipped from the field through other channels is given below. The averages represent the best obtainable figures on the production of the field:

1885.	Macksburg P. L. Runs.	Outside Shipments. Est	Daily Average Production.
January	11,894	1500	432
February	20,625	1500	790
March	27,067	1500	922
April	40,527	1500	1400
May	48,258	1500	1605
June	64,982	1500	2216
July	75,737	1500	2492
August	74,228	1500	2443
September	68,110	1500	2320
October	63,619	7000	2278
November	60,926	7000	2264
December	61,113	7000	2197
Total	617,086	34,500	1785
1886.			
January	54,806	7000	1994
February	49,694	7000	2025
March	58,795	8973	2186
April	64,137	7890	2401
May	58,566	66.0	2104
June	65,319	2871	2275
July	58,410	4080	2016
August	57,492	2790	1945
September	48,918	1240	1672
October	46,937	3240	1619
November	41,359	4090	1515
December	49,578	3040	1407
Total	645,101	58,844	1682
1887.			
January	37,134	4500	1343
February	28,514	1200	1061
March	32,549	7400	1015
April	29,128	4200	1110
May	27,750	1500	970
June	28,609	3300	1010

No wells were completed in the Macksburg field in June and but 3 wells were drilling at the close of the month. The field is becoming of small importance and operations are very quiet. Two wells were completed in May and one in April. On the 30th of the month there were 468 producing wells connected with the pipe lines, with a total daily average production of 1010 barrels.

THE EUREKA DISTRICT.

At Eureka, W. Va., B. F. Ney's well on the the Biddle farm, Cow Creek, was reported dry on the 18th of June. Only 18 inches of Macksburg sand was found. The Brown No. 2 was shot with 48 quarts of nitro-glycerine and settled down in a few days to a 12-barrel well. The Barnsdall & Mills mystery was opened up and shot with 50 quarts. The casing collapsed and damaged the well to some extent. After it was got to flowing it proved of about the same calibre as the Brown No. 2. Barnsdall & Brown will start the drill near Brown No. 2, and Barnsdall & Mills have a rig ready for the drill. The Johnson well, on French Creek, one-half mile east of the gas well, is down about 1500 feet and will be mystified.

THE total exports of petroleum from America, in gallons, according to a German circular, from January 1 to June 13, for the years 1886 and 1887, have been as follows:

	1887. Gallons.	1886. Gallons.
To Europe	162,796,421	149,745,401
To East Indies, etc	49,994,370	73,482,830
Total	212,790,791	223,228,231

BUFFALO consumers are now supplied with natural gas at net rate of 20 cents per 1000 cubic feet.

RUSSIAN PETROLEUM TRADE.

STATISTICS FOR 1886—INCREASED EXPORTS.

IN my report upon the Russian petroleum business, dated November 1, 1886,* the exports of petroleum products from this port for the first nine months of the year 1886 were given, and I now give herewith the total exports of petroleum products from Batoum for the years 1885 and 1886, showing an increase in 1886 over 1885 of about 72 per cent.

The greatest increase in the export to any one country, as will be seen by these statistics, was to Austria-Hungary, and the cause of this great increase was the unjust discrimination in favor of Russian oil of the customs authorities at Fiume, in admitting a valuable combination of Russian manufactured oil at the rate of duty required by law for a comparatively worthless crude oil, which was fully explained by my letter of December 30.†

The only countries to which there was less oil exported in 1886 than in 1885 are Turkey, Italy, and Roumania, but it is very probable that if the destination of the January (1886) export was known in detail the apparent decrease to Turkey and Italy would be greatly reduced. The expiration (on October 21, 1886,) of the commercial treaty between Russia and Roumania, by which Russian products were admitted to Roumania at a uniform and very low rate of duty (5 per cent., I think,) stopped the export to Roumania early in October.

It seems as if the Russian exports must have been felt by the American trade, but as the export of petroleum products from the United States for the year 1886 shows an increase over 1885, it is difficult to see where the Russian products have interfered with the American, except of course in Austria-Hungary, where Russian oil is better protected against American, and even domestic competition, than it is in Russia itself.

RUSSIAN PETROLEUM IN INDIA.

The attempt of Russian exporters to invade India with their illuminant is not such a serious menace to American exporters as it appears to be for many reasons, the principal of which are: First—The result from Russian refined in ordinary lamps cannot be compared with that obtained from American oil; it is possible that the Russian oil may be condemned in India by consumers, and other trials asked for it, upon the ground that the first shipments were not of the best quality obtainable in Russia; it is not at all probable, however, that such astute business people as the Rothschilds, who are the leaders in this export, have sent to such a new and important market as India anything but the very best quality of refined that can be made from Russian crude; in fact, it is more likely that the quality of first shipments is superior to any other that may be sent there in the future; it will certainly not enjoy there the principal advantage it has in Russia, *i. e.*, lamps especially prepared (by greatly increased draft) for burning it. Second—The inferior manner in which it is packed will be no trifling objection

to it; the cans made here are tolerably good, but the cases, owing to the difficulty in procuring suitable lumber and intelligent labor, are very bad, and hardly calculated to stand a long sea voyage. Third—The fact that a supply at a paying price cannot at present be depended upon; the total sales for Indian exports were six cargoes (about 400,000 cases), and the loss to the sellers has been very heavy, owing to the advance in price, caused by the increased demand and limited facilities for making cans and cases.

RUSSIA AS A COMPETITOR TO THE UNITED STATES.

Any one at all familiar with Baku oil territory and production must believe that Russian oil must eventually force itself upon the markets of the world and become a formidable competitor to the American article, but the time when it will materially influence the markets of the world, or even of Europe, is not quite so near at hand as the interested and thoughtless advocate of the article and the marked increased export of 1886 would lead one with little information of the trade to suppose. In fact it does not appear to be such a dangerous antagonist of the American export trade now as it did six months ago; for then the quantity that could be placed in competition with the American oil was unknown, while now it has been clearly demonstrated that last year's business cannot be materially increased until additional transportation facilities from Baku to Batoum are provided. This is fairly proven by the present existing state of affairs here. The average price of refined oil in bulk at Batoum for the first eleven months of 1886 was about 3 cents per gallon, while the average price since December 1, 1886, has been from 4½ to 5 cents per gallon. That this advance in price was wholly due to the demand at Batoum, to keep employed the many steamers chartered in reckless haste by the Russian exporters in their laudable but Quixotic ambition to drive the American oil from the markets of the world and bankrupt the American exporters—that this demand was not from the European markets is demonstrated by the fact that there was no advance in the price of Russian oil in any of these markets—is clearly proven by the fact that while refined oil for any other purpose than Batoum shipment could, and can now, be bought at Baku at 1 cent per gallon, and the regular railway transportation charge is 1½ cents per gallon, making a total cost of 2½ cents per gallon in Batoum for refined free on board tank-cars at Baku for Batoum, the seller finding the cars, 3 to 3½ cents per gallon (according to buyers' necessities) can be readily obtained; in other words, the limited railway transportation causes tank-car capacity to be worth a premium of 2 to 2½ cents per gallon, and when I was in Baku, two weeks ago, it was there asserted that even common rack freight cars, for carrying oil in barrels, were worth about ½ cent per gallon premium. That the Batoum exporters have suffered severely financially from this state of affairs cannot be doubted. It is true many of them had contracts with Baku refiners for refined free on board cars at very low prices, but it is equally certain that the refiners have since the advance refused to deliver upon such contracts, and in order to obtain the oil which was absolutely necessary buyers have very generally been compelled to pay a much higher price than that called for by contracts. The harbor here is now full of sailing vessels on demurrage because of the impossibility of getting oil fast enough to load them; and there are also some steamers here loading and waiting for cargo, but of course the steamers are given precedence over sailing vessels because of the heavier demurrage upon them. The present outlook for

*Printed in PETROLEUM AGE, April, May, June, 1887.

†The following translation of an item from a recent number of the Russian journal, *Reporter of Finance and Manufacture*, will give an idea of the notoriety this export has obtained in Russia and the feeling regarding it:

"According to the report of the Consul at Fiume the import of the crude oil at that port from Russia for November, 1886, was 46,254 quintals; for the eleven months of 1886, 330,739 quintals.

"And all this is downright falsehood, as in reality not a single quintal has been sent by us, but uncleaned illuminating distillate, distilled at Batoum by the addition of 8 to 10 per cent. crude, was exported and entered at Fiume as crude oil in prejudice to the Austrian Government, which is being cheated of the high import duty on manufactured oil by this fraud, and also in prejudice to the Russian Government."

the exporters, although not very cheering, is still much brighter than it was a month ago, because the exceedingly bad weather for fifteen to twenty days in January made loading vessels impossible (and thus made their detention a charge upon their owners instead of upon charters,) while it did not seriously impede railway traffic, so that the exporters had the benefit of this time in which to get oil here. Nevertheless considerable demurrage was paid and more claimed in January; one steamer taking case oil to Bombay claimed (and it is said will get) nearly £1,000 sterling for demurrage and short freight.

FACILITIES FOR TRANSPORTATION.

There are now in this trade 10 tank steamers, with an aggregate annual capacity to ports for which chartered of from 75,000,000 to 80,000,000 gallons, and two or three more are reported due here soon, while the carrying capacity of the railway at present is not estimated by the most sanguine to be over 70,000,000 gallons. Thus it would seem that the gratuitous (?) puffing which the Russian petroleum business has lately had in the European press, with the very plain object of sending much needed capital to its assistance, has been only doubtfully successful, inasmuch as it has resulted in sending to the assistance of the trade, not money, but ships in such numbers as to advance the price of the oil their charters are compelled to buy, in order to keep them employed, to such a figure as to make the loss from the sale of it in European markets so great as to startle even the Russian exporter, who has heretofore exhibited such a courageous disregard of financial results. The situation must undoubtedly improve; because, at present prices for Russian refined at Batoum, profitable competition with American oil at present prices at New York is impossible, even in the Levant. Some of the many steamers chartered for the trade will be compelled to remain idle at the expense of charterer, and of course all the charterers of these vessels feel very sure that they will not suffer in this manner, but that their competitors here must, and thus allow them to continue to export at no loss, and perhaps (with an advance in prices in America) at a profit.

The lesson the Batoum trade is now learning is undoubtedly an expensive one, and may impress upon it the fact that the price of refined at Batoum, and consequently the business of exporting, are wholly dependent upon the capacity of the railway for carrying oil from Baku to Batoum, a material increase of which seems further away than ever, since it is currently reported and believed in Tiflis that the project of tunneling the Suram Pass has been pronounced impracticable (impossible is the word used,) and abandoned by the engineers who had charge of the preliminary work. Some private tank-cars will be added to the rolling stock of the railway in the spring, but the conditions upon which these cars are accepted by the railway company, viz., that they can only be taken over the Suram Pass after all the cars belonging to the company are out of the way, seem to indicate a doubt in the minds of the railway officials as to their ability to handle any more cars than are now in service.

PIPE LINE.

The project of constructing a pipe line from Baku to Batoum, after having been definitely decided by a notorious English romancer, who published his specifications for the line in an English journal several months ago, was finally considered by a joint council of the ministries of finance and State domain, in St. Petersburg, January 12 (24 new style), and a conclusion arrived at against the construction of a line by the Government,

but ostensibly favorable to the granting of a concession for the construction of a line (for crude only, and subject to strict Government control,) under certain conditions, sixteen in number. I have had a translation made of these conditions, and while it would no doubt prove of great interest to American readers, in showing them the remarkable ideas held by Russian pipe-line experts, I do not give it because the one clause, viz., "No. 10, the company must prepare all necessary pipes and reservoirs at Russian works and of Russian material," precludes any possibility of American competition for furnishing material for it, and consequently the other conditions are of no importance to Americans. I will merely say that of the sixteen conditions there are eight, any one of which would, I believe, prevent any one with even the slightest knowledge of the pipe-line business from accepting this concession.

SIGNS OF EXHAUSTION.

The producing territory at Baku shows no more marked signs of exhaustion than it did six months ago; nevertheless the feeling that it is not inexhaustible seems to be gaining ground among those most interested, some of the best advised of whom, after having, as they claim, made a careful and intelligent study of the subject with the aid of both practice and science, declare that the present developed territory will be wholly exhausted in five years. The volume of production, however, shows no decline: on the contrary, a two weeks' visit to the producing district in January leads me to believe that the production of crude is at present as great as it ever has been. There are two or three wells, which if allowed to flow, would probably yield all the crude required by the refineries, but as the demand for crude is exceedingly limited these wells were not allowed to flow. In fact the production is at present so great, and has such an insignificant influence upon export (for reasons already given) that it can have little interest to the American trade, but some figures relating to the financial results of this branch of the business may not be uninteresting, especially after the mass of nonsense that has been published by sensational writers in the English press concerning it. The average price of known or supposed producing territory in the vicinity of Baku is \$5000 per acre, and the cost of drilling a well 800 feet (they are now drilling deeper) about \$10,000 to \$13,000. Consequently the minimum cost of one acre with three wells is \$35,000.

The average yield of Baku wells, if the result from nearly 100 average wells, some of which yielded from 9,000,000 to 15,000,000 poods each, can be taken as a criterion, is less than 1,000,000 poods each. The price for crude at wells in 1886 did not average $1\frac{1}{2}$ copecks per pood, and with as much production now as at any time last year, heavier stocks everywhere in Russia than a year ago, and the improbability of increasing export this year, there is no reason to expect a higher price in 1887 than ruled in 1886, especially as the price now is only one-half to three-fourths copeck, and will remain so for only limited quantities up to May 1. Taking three wells on one acre costing \$35,000, and producing in the aggregate 3,000,000 poods, at $1\frac{1}{2}$ copecks per pood, will give total receipts of about \$20,000, or \$15,000 less than cost, allowing nothing for expenses of delivering crude to the pump station of buyer, which must be borne by producer, nor for any other expenses or probable loss from selling to a party who may not pay promptly as he agrees (crude oil is not sold for cash as a rule, but on three, six, and nine months' credit.) If the three wells were drilled at one time, it would require at least one

year to finish them, and probably one year more to obtain all the oil from them, consequently to realize 15 per cent. in two years upon an investment of \$35,000, a producer would have to get twice as large wells as the average, or realize twice the average price for his production.

When at Balakhani I saw a well flowing, it was said, 30,000 barrels per day, and I did not doubt that this estimate of the production was a reasonable one. The flow from this well could not be stopped, because when an attempt was made to stop it, by closing the valve on the top of the pipe, the oil came up around the outside of the pipe and threatened to undermine the derrick. Thirty thousand barrels of crude oil per day from one well, without an explanation of the vast difference between American and Russian production, would be very misleading. If the whole production of this well *could have been sold* at the market price of one-half copeck per pood, it would have given a daily revenue of about \$560, while an American well producing 800 barrels per day (a much more common thing than a 30,000-barrel well in Russia) would at present low prices in America give about the same revenue. This sum would be net to the American producer, as his oil is taken away at no expense to him and can *always* be sold for cash; besides, the American well will produce oil for as many years as the Russian will months, or in many cases weeks.

BIBI-EIBAT WELL.

Some time ago there appeared in many American newspapers a very sensational account of an immense petroleum well struck several months ago at a place near Baku, called Bibi-Eibat, which account was accredited to what was called an "eminent English authority upon Russian petroleum." This well was referred to in my report, and while it was undoubtedly a remarkable well, one of probably not more than half a dozen such that have been found at Baku, it is equally certain that the sensational writer referred to withheld some of the facts which were known to him concerning it, and enlarged upon the ones that suited his purpose best. The statement that the oil from this well deluged the town of Baku, five versts away, was exceedingly misleading, had it been true, which it was not. A village probably a mile from the well was, however, thoroughly sprinkled with oil, because of the very high wind blowing from the Caspian Sea during the few days the well was flowing, but the same thing would have resulted from a well producing 5000 barrels per day in the manner in which this well was said to be producing 50,000 barrels. The fact as stated by the Baku paper that the owner of this well would lose 100,000 rubles (\$45,000) because of damage done by the well to his own and other property, was omitted from the sensational accounts I saw of the well; but this loss was, I think, like the production of the well, greatly overestimated, at least 50 per cent. The well flowed furiously fourteen or fifteen days, then declined to 2000 or 3000 barrels per day, and when I saw it, about three months after it was struck, had entirely ceased to produce; if, however, it had produced all that the most sanguine had claimed for it, and its production had been sold at market price, it would have realized less than \$15,000, or a trifle more than the average cost of a Baku well.

These figures regarding Russian production (and that they are very fair will, I am sure, be confirmed by any one with a knowledge of the business and unprejudiced by self interest) will give an idea of the value of the Baku petroleum "Molochs," and in a great measure ac-

count for the present impoverished financial condition of the Russian producer.

JAMES C. CHAMBERS,
Consular Agent.

UNITED STATES CONSULAR AGENCY,
Batoum, February 1, 1887.

Exports of petroleum products from the port of Batoum for the years 1885 and 1886.

To—	Illuminating oil.		Crude, residuum, lubricating oil and distilla e.		Total.		1886.	
	1885.	1886	1885.	1886.	1885.	1886.	Decrease	Increase.
	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.	Gallons.
England.....	1,748,300	1,907,500	1,427,075	1,980,185	3,175,375	3,887,685	712,310	
Germany.....	250,000	1,490,000	40,100	1,300,550	290,100	2,790,550	2,500,450	
Austria-Hungary.....	3,281,570	7,069,880	613,115	6,221,090	3,894,685	13,290,970	9,396,285	
France.....	1,056,125	1,718,400	1,410,070	1,649,135	2,466,195	3,357,535	891,340	
Spain.....	12,000	308,000			12,000	308,000	296,000	
Italy.....	3,239,470	2,181,000	1,055,740	1,078,200	4,295,210	3,259,200	1,036,010	
Turkey.....	11,843,950	10,476,290	218,500	7,905	12,062,450	11,484,195	1,578,255	
Roumania and Servia.....	5,197,060	4,604,410		81,150	5,197,060	4,685,560	511,500	
Holland.....			10,000	120,000	10,000	120,000		110,000
Belgium.....				1,377,800		1,377,800		3,415,550
Denmark.....								300,750
Greece.....				1,750				420,250
Algiers.....								269,000
Tunis.....								103,000
Egypt.....								1,678,960
Bulgaria.....				500				49,000
India (Bombay).....								1,250,100
Other countries.....				100				236,850
January, 1886, (not obtainable in detail).....								4,566,015
Total.....	26,805,325	39,321,005	4,774,600	14,915,315	31,639,925	54,236,320	3,362,615	25,959,010

Increase in 1886 over 1885, 22,596,395 gallons.

SUMMARY of the Statement of the Tidewater Pipe Company, Limited, for June, 1887:

Quantity of crude petroleum in custody at beginning of June.....	Barrels.	1,567,978.78
Quantity of crude petroleum at close of June.....	1,736,551.28	
Less sediment and surplus.....	174,714.76	
Receipts during June.....	1,561,836.52	
Received in iron tanks.....	176,089.25	
Deliveries during June—to refiners.....	217,690.05	
to other parties.....	217,690.05	
Outstanding certificates, accepted orders, etc.....	881,000.00	
Credit balances.....	680,836.52	
Total liabilities June 30, 1887.....	1,561,836.52	

MAY SUMMARY.

Quantity of crude petroleum in custody at beginning of May.....	Barrels.	1,556,305.60
Quantity of crude petroleum at close of May.....	1,762,807.87	
Less sediment and surplus.....	194,829.09	
Receipts during May.....	1,567,978.78	
Received in iron tanks.....	183,207.78	
Deliveries during May—to refiners.....	222,821.19	
to other parties.....	222,821.19	
Outstanding certificates, accepted orders, etc.....	847,000.00	
Credit balances.....	720,978.78	
Total liabilities, May 31, 1887.....	1,567,978.78	

MAPS of the Zoar oil field at the AGE office.

THE PETROLEUM AGE,

DEVOTED TO THE
INTERESTS OF THE PETROLEUM TRADE.

PUBLISHED MONTHLY BY
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THE NEW BUILDING

OF THE NEW YORK CONSOLIDATED STOCK AND PETROLEUM EXCHANGE.

For the following account of the Consolidated Petroleum Exchange, with cut of the new structure, now building, we are indebted to the *New York Morning Journal*:

and dashing brokers of the street and it is an ever growing rival of its older and more aristocratic neighbor, the Stock Exchange.

On several days recently more shares of Reading stock were traded in on the Consolidated than on the Stock Exchange, a fact which has been much commented upon.

The advance in the value of seats on the Consolidated Exchange is another striking feature. Six months ago a seat could have been purchased for \$900. Several were sold last week for \$1600, and the more enthusiastic members predict that seats will sell at \$3000 when the Consolidated is established in its new Exchange. The membership is now larger than that of any Exchange in this country except the Produce, and leads the Stock Exchange by over 800 members.

The building is situated upon the ground bounded by Broadway, Exchange Place and New street, and fronts upon each of these thoroughfares. It has a frontage on Broadway of 90 feet 11 inches; Exchange Place of 132 feet 4 inches, and on New street of 87 feet 7 inches. It consists of a basement of 15 feet, which forms the first



The 2403 members of the Consolidated Stock and Petroleum Exchange feel justly proud of their new and magnificent structure which is now being built for them at the corner of Exchange Place and Broadway, and which when completed will be one of the finest and most conspicuous buildings which adorn that great thoroughfare.

The growth and progress of the "Consolidated Exchange," as it is usually called, is a source of wonder to those who have not watched its constant development. It numbers among its members many of the most active

story on New street, being above the level of that street; a main story of 36 feet, of which space 12 feet is used for a mezzanine story.

Above the main floor there are four office stories, entirely distinct from the remainder of the building. These offices, 120 in number, will be reached by two extra large elevators of great power, besides several wide staircases. The offices will be handsomely finished in hard wood and there will not be a dark office in the whole building, as large interior courtyards insure an unusual degree of light to every room. Tenants of these offices

will have spacious and separate entrances on Broadway and New street.

A large restaurant will be located in the basement. Steam will be used to heat the entire building.

The main floor will be devoted wholly to the Exchange, giving fully 10,000 square feet of room. It will be superbly lighted. The three arches on the south and three each on New street and Broadway, give an area of glass equal to 4500 square feet.

A handsome gallery runs around three sides of the big room, affording visitors a fine vantage ground from which to view the struggles of the bulls and bears. The telegraph offices will be located in the basement, where they will be easy of access to the members.

The building will be constructed of Corse Hill Scotch red sandstone and Philadelphia pressed brick, with iron and terra cotta work in portions. The style is Romanesque, eclectically treated, and the building will be absolutely fireproof.

The Exchange now has a building fund of \$400,000 in cash, and it pays the heirs of each member \$2000 in case of death.

The Consolidated Exchange was originally the New York Mining Stock Exchange, which was organized in 1875. By successive absorptions it consolidated with the National Petroleum Exchange, the Miscellaneous Security Board, the American Mining Board and the New York Petroleum and Stock Board, adopting in 1885 its present name of the Consolidated Stock and Petroleum Exchange.

The members of the older Stock Exchange do not look with favor upon the growth of their younger rival, but, as one of the Consolidated brokers asks: "What can they do about it?"

In July, 1886, a building company composed of leading members of the Consolidated was incorporated, and it is to the efforts of these gentlemen that the great success of the plan is largely due. They are Jerome F. Sadler, President; Alfred L. Faris, Vice-President; Francis G. Saltonstall, Treasurer, and George W. Hoagland, Secretary, and a Board of Directors consisting of Messrs. John Stanton, Charles G. Wilson, Thomas L. Watson, Jerome F. Sadler, Charles F. Thumm, Robert A. Cheesebrough, Alfred L. Faris, F. G. Saltonstall and George W. Hoagland.

The new Exchange is expected to be ready for occupancy early in the fall, and it will be a notable event in the financial and speculative history of New York City.

Crude Oil for Locomotives.

The first train that ever ran, or attempted to run, west of the Allegheny Mountains with crude petroleum as the only fuel for its locomotive was the mail train west on the Pennsylvania Railroad that arrived in Pittsburgh June 18. It came through from Altoona on time and without a stick of timber or a scuttle of coal to make steam.

The train was drawn by locomotive No. 408 with Engineer Burbanks at the throttle. There was entire uniformity of heat in the fire-box without any stoking to make it. The pipes from the 200 gallons of crude oil in a tank in the tender did the business. The experiment was a complete success. Splendid time was made, and there was no annoyance from smoke or cinders.

Experiments in this line have been quietly progressing under Pennsylvania railroad auspices at Altoona, but this is the first time the long run to Pittsburg has been attempted with only oil for fuel.

The process is the invention of a Russian scientist, and Dr. Dudley, of the Altoona shops, has been developing it slowly but surely.

THE PRODUCING REGION.

At the beginning of June there were 81 new rigs and 161 drilling wells in the New York and Pennsylvania oil region, a total of 242. The number of wells completed in June was 179 with an estimated new production of 6380 barrels. The dry holes numbered 35, leaving 144 productive wells, with an average yield of 44 barrels. In May there were 110 productive wells finished, which averaged 29 barrels each, and the dry holes were 36 in number. The new wells in April averaged 49 barrels, the March wells 42½ barrels, the February wells 65½ barrels, and the January wells 30 barrels each. The June figure show an increase of 33 wells and of 3198 barrels new production as compared with the figures for May. May had a decrease of 23 wells and of 3056 barrels new production, while April recorded an increase of 36 wells and of 2451 barrels in the new production. At the close of June there were 67 new rigs, 107 old rigs and 138 drilling wells in the entire region, a total of 313 as compared with 81 new rigs, 107 old rigs and 161 drilling wells, a total of 349 at the close of May.

This is a decrease of 14 new rigs, an increase of 1 old rig and a decline of 23 drilling wells from the figures of May 31, or a net decrease of 36 in active operations. May had a net decline of 7 from the figures for April. April had a decrease of 9 in rigs and drilling wells from the March report, while March showed an increase of 7 in active operations over February, February a decrease of 40 from the January report, January a decrease of 48 from December and December of 95 from the November figures. At the close of June, 1886, the record showed 198 new rigs, 143 old rigs and 402 drilling wells, a total of 743. In June, 1886, 372 wells were completed, with 56 dry holes, and the new production was 9027 barrels. The increase in the new production of the June wells is due to the performance of a phenomenal strike by John McKeown within the defined borders of the Washington field and a couple of large wells at Reibold and Kinzua Village. None of the ventures add anything extensive in the line of fresh territory, and are only important as showing the latent powers that sometimes lie in the unexpected.

THE ALLEGANY FIELD.

The Allegany field completed 7 wells in June with a new production of 33 barrels. The only dry hole on the list is a well drilled for gas by the National Transit Co. on lot 12, Clarksville. There were 7 wells completed in May, 3 in April and 8 in March. At the close of the month 3 new rigs are up and building with 3 drilling wells under way.

THE BRADFORD FIELD.

Bradford completed 22 wells in June with a new production of 180 barrels. Thirteen productive wells and 86 barrels output was the story of May. No dusters were completed in June. The recently discovered extension in the extreme southwestern part of the field continues to afford some very good wells. At the close of June there were 9 new rigs and 16 drilling wells in the Bradford field as compared with 11 new rigs and 16 drilling wells at the close of May.

WARREN AND FOREST.

There were 69 new wells completed in the Middle field in June, including 9 dry holes, and the new production was 1173 barrels. This is an increase of 5 wells and of 452 barrels production as compared with the figures for May. On the last day of June this division of the producing region showed 32 new rigs, 17 old rigs and 29 drilling wells against 32 new rigs, 10 old rigs and 41 drilling wells on the last day of May.

KINZUA VILLAGE.—Odell, Smith & Co.'s No. 3, on the Johnson tract, west side of the river, produced 1200 barrels for its best 24 hours work. No. 4, one location in advance did about 400 barrels at its best, and the Moore & Phillips venture on warrant 5555, about 300 rods ahead on a good line, was a total failure. The Sill & Odell test near the northeastern corner of warrant 2921, three miles in advance of the development, found gas in considerable quantities, with a small showing of oil. There is still an opportunity for an extension to the southwest, between the Morse & Phillips' duster on 5555 and Sell & Odell's dry hole on 5564, which are about 200 rods apart in an east and west direction.

Clarendon and Tiona reveal their accustomed amount of activity. John L. McKinney & Co. are shipping the most of their Tiona production to Corry. Kane, Balltown and Cooper are very quiet, and outside of Grand Valley little is doing within the borders of Warren county.

GRAND VALLEY.—The discovery of several small wells where good ones were anticipated has exercised a temporary check in operations about Grand Valley, which is shown in the diminished volume of new work. Twenty-six wells were completed in June, 4 of which were dry. L. B. Wood & Co. drilled a duster on the Moore farm, while Stewart & Co. are credited with the same result in the Spring Creek region.

ELK COUNTY, ETC.—Seven wells were completed in the Elk county district during June of the 10 or 15-barrel class and the development of the new field proceeds with the usual vigor. Some doubts are still afloat in regard to the Murphy mystery and the production of the well seems to be the point upon which one or two land deals are pending. The impression prevails that the well would have been larger had Murphy secured control of the adjacent property. No wildcat wells of any importance were completed in the Middle field in June.

THE LOWER COUNTRY.

There were 81 wells completed in the Lower country in June, 25 of which failed to find oil; the new production was 4994 barrels, an increase of 17 wells and 2627 barrels production over the May figures. On the 30th of June the Lower country had 23 new rigs, 36 old rigs and 90 drilling wells, as compared with 26 new rigs, 31 old rigs and 99 drilling wells on the 31st of May.

VENANGO.—Venango county presents an increased list of drilling operations for June, owing to interesting developments at Shamburg, Slab Furnace, Raymilton and Mt. Hope. At each of these points good wells have been found which add increased territory to producing areas that have been deemed for years completely defined. Venango county contains a large amount of land that was only partially tested in the past, and while no new pools of large area can be expected, the possibilities are always good for paying producers of moderate calibre. Some of the wells found at Shamburg start off quite large, from 40 to 80 barrels the first 24 hours, and hold up nicely for 30 days or more, when they slowly sink to the average of the older wells in this district. Territory is in good demand and Shamburg is now the liveliest portion of Venango county. A 50-barrel well has been reported since the first of the month on the Beaver & Kepler tract, seven miles northeast of Pleasantville. A couple 10-barrel wells near Slab Furnace has excited fresh interest at this point, and a few wells are being sunk on the edges of the old producing region at Raymilton, in the western part of the county. The Mt. Hope or Smoky district is also attracting renewed attention, while Tarkill and Tipperary are becoming of less import-

ance. Venango records 13 new rigs and 15 drilling wells at the close of June against 15 new rigs and 17 drilling wells at the close of May.

CLARION

The well of Stewart & Co., or the Monroe Oil Co., on the Frampton farm, about a half mile northeast of the Pioneer well, on the Kifer farm, was shut down after the sand was struck while more lands were secured. When the time came for opening up the well it was found to be filled with salt water instead of oil. The well was expected to be a failure, but subsequent pumping had raised it to a 3-barrel well about the first of the month. Hess, Sackett & Co. continue to use the oil from their well on the Kifer farm for illuminating purposes. The well drilled by the Strattonville Oil Co. was a duster. There is a small amount of drilling under way on the ragged edge of the Cogley district. Only three wells were completed in Clarion county in June and one of these was a duster. Three new rigs and six drilling wells were in progress June 30.

BUTLER AND ARMSTRONG.

Thomas W. Phillips, who watches nearly all his wells drilled into the sand, predicted that the Reibold streak would take a turn to the westward before any wells were drilled beyond the tunnel, and leased ground on that theory. The drilling of the month of June in the Reibold district corroborated the theory, only the bend was found further to the southwestward than it had been expected. The streak is, however, exceedingly narrow and is confined to the six-acre lot of Burehfield & Co., upon which the advance well which gave such an impetus to drilling in its immediate vicinity is located. Phillips & Osborne's No. 1, on the Dunbar, and Nos. 1 and 2, on the Stewart, were failures. The No. 3, on the Stewart, one location north of No. 2, was a genuine surprise to the trade, as it proved a gusher which would take rank with the great wells of the field. At its best it produced 110 barrels per hour, and on July 9 was producing 200 barrels per day and had that gauge on the 16th, one week later. No. 6, on the Stewart farm, is located on a 22 degree line northwest of No. 3 and 400 feet from it. Phillips & Osborne's No. 2, on the Stamm farm, is 65 rods north of No. 1, on the same farm. If an outlet to the streak or pool passes as far to the westward as Evans City, the wildcatting up to date has not resulted in determining its drift or location. Phillips & Osborne added another failure to their list when No. 5, on the Stewart farm, was completed. The Marshall Oil Co.'s well on the Peiffer farm is located north of the duster on the Mays farm and will make a small producer. The sand is reported to be of inferior quality, but more drilling will be required to determine whether it is on the end or one edge of the development. There is still a chance for an extension to the westward from the good wells immediately north of the Lappe failure. The band of prospectors have abandoned the country southwest of Reibold in their search for a new pool and will go to the westward about the mouth of Breakneck Creek. For the 24 hours ending July 16 the 75 wells in the Reibold pool were producing 4930 barrels, a decline of 735 barrels from the yield of the previous week. Albert & Morrison's well on the Thompson farm, north of the town of Butler, caused a scramble for lands soon after the sand was struck, but the excitement subsided when the well was opened to the public and the play by interested parties was consummated.

SHANNOPIN.

There is nothing new in the way of field developments in the Shoustown or Shannopin section. The only event of note since our last report was made is the transfer of

a controlling interest in the field to James Amm & Co., a company representing to a large extent Standard capital. Among the gentlemen who are connected with the company are Messrs. Dan O'Day, Joseph Seep and W. A. Pullman. As this field is only 17 miles from Pittsburgh and oil gravitates from it to the Ohio River, the Standard people could not afford to have the producer taking advantage of its geographical situation to get the pipe-age and Lower country advance for a premium on his oil. In the trade which was made Bayne & Fuller sold the one eighth royalty of the Morrow farm to A. F. Allen Brown for \$20,000, and he sold this royalty and his nine-sixteenths interest in the properties in which the Raccoon Oil Co. have seven-sixteenths to James Amm & Co. The price paid is reported to be in the neighborhood of \$180,000. At the time the Marks No. 1 was struck Mr. Brown refused \$210,000 for this same interest from John L. McKinney & Co. Messrs. E. H. Jennings, W. C. Kelley, Jacob V. Kelley and Cooper, who make up the Raccoon Oil Co., retain their seven-sixteenths in the field.

GREENE COUNTY.

It has been reported that an increase of oil was struck in the deep sands at the Mount Morris well during the month of June: but this is only a conjecture. More or less drilling was done at the well in that month, and it is believed that the level of the Gantz sand has been passed. Mr. Hukill, when seen at his office in the Coal and Iron Exchange building in Pittsburgh, is courteous to all callers but silent concerning the true situation at the Mt. Morris well. It is definitely known that the boiler blew up at the well toward the close of June without doing harm to any one. Mr. Hukill has the field all to himself at present, though a Bradford man has taken some leases in this section in the past few weeks.

WASHINGTON.

John McKeown's No. 4, on the Martin farm, 600 feet east of No. 3, had enough new production on the first of the present month to change the complexion of the monthly report. According to the gauge by the scouts the well for the 24 hours ending July 2 flowed 3440 barrels. The well is credited with a production of 300 barrels per hour at times after being agitated, but has not held up at this figure for any one 24 hours. There is a dry hole a mile to the northeast of the well and one three-quarters of a mile southeast of it, the gap between the two dry holes being about a mile and a quarter. While there are small wells behind the monster there is room for more gushers ahead of it, but they never have been found in large groups in the Washington field. This well began to show oil in top of the Gantz sand and when three bits in flowed 75 barrels per hour. Since the completion of the McGahey No. 1, at the northeastern end of the Washington field, Col. Dyer's lucky star has not been in the ascendancy. The well which he and Dr. W. B. Roberts, of Titusville, drilled at Baker's station, on the Washington & Waynesburg R. R., was a failure in all sands.

The Taylorstown field furnished a well on the 15th of July which depressed values and enlarged or extended the streak a half mile to the southwestward. It was expected to be a well, but the indications at the Cundall bespoke a much smaller producer on the Flack farm than the first 24 hours gauge shows it to be. According to the figures of the veteran Tupper it produced 350 barrels in its first 24 hours. Nearly all the wells in the Taylorstown district have to be packed and tubed within a short time after they are completed on account of the gas not being sufficiently strong to make them do their best through the casing. R. H. Thayer, A. B.

Caldwell and others are drilling test wells outside the solid block of lands leased by the West Virginia Natural Gas Co. The West Virginia Natural Gas Co. have built a pipe line from their wells to the B. & O. R. R.

Below is a list showing the production of wells by groups on the different farms which make up the total of the Washington field for June 11 and July 16, 1887:

Farm.	Operator.	Number of wells, June 11.	Production June 11, Bbls.	Number of wells, July 16.	Production July 16, Bbls.
Gordon, P. L. & H. Co.		5	164	5	127
Hess, "		3	13	3	26
Weirich, Forest Oil Co.		2	82	2	61
Hall, "		4	56	4	49
Barre, "		13	755	13	813
Taylor, Union Oil Co.		7	238	7	207
Morgan, "		8	237	8	175
Davis, "		6	409	6	393
Dye, "		1	28	1	25
Workman, "		2	157	3	150
McGovern, "		1	24	1	25
Clark, "		1	2	1	2
Zelt & Martin, Associated Producers Co.		2	11	2	11
Wiley, "		1	6	1	6
Curry, "		1	10	1	10
Gantz, Citizens' Oil & Gas Co.		1	15	1	18
Weaver, "		1	7	1	15
Clark, Hallam & Co.		1	5	1	5
Taylor, Galigan & Young.		2	53	2	30
Clark, R. H. Thayer & Co.		6	137	6	128
Munce, John McKeown.		14	445	12	392
Martin, "		4	550	4	347
Quail, "		1	5	1	2352
Smith, Willets & Young & Chartiers O Co		6	99	6	6
Cameron, "		9	395	9	110
Wright, Chartiers O Co & F W Andrews.		3	103	3	308
Fergus, Chartiers Oil Co.		2	259	2	94
Stewart, Fisher Oil Co.		1	24	1	233
Lead Lot, Marsh & Caldwell.		1	12	2	17
" McKeever & Mulholland.		1	8	2	36
Fair Grounds, Wheeling Oil Co.		3	56	3	45
Cradle Factory Lot, Miller.		2	43	2	34
Hall Lot, Guffey & Co.		1	5	1	5
Linn, Coast & Co.		3	57	3	50
Weirich, "		1	12	2	18
Hayes, "		1	7	1	18
Shirls, Shirls.		3	30	3	20
Manifold, Pew & Emerson.		2	60	2	55
Gabby, "		1	5	1	5
Martin, Central Oil Co.		3	115	3	163
McGahey, Mascot Oil Co.		4	119	4	81
Miller, (Bunghole well), Reid & Co.		1	1	1	1
Montgomery, McKinney & Co. & Robbins.		2	11	2	12
Thome, Chartiers Oil Co & F W Andrews.		1	5	1	0
Wade, B. B. Campbell.		3	558	3	205
Weaver, Hart Bros.		1	12	1	15
Thome, Lee & Shank.		2	50	2	37
Wiley, Munhall & Co.		2	8	2	7
McKean, Caldwell & Co.		1	12	1	0
Van Kirk, "		1	4	1	4
Whittlesee, "		1	185	2	115
Watson, Butler & Co.		2	10	2	16
Martin, Allen & Co.		1	16	1	15
Munce, 1 Willets & Son.		23	645	23	510
Montgomery, Montgomery & Co.		1	10	1	8
McNary, Craig & Co.		1	4	1	2
Welsh, Reed & Co.		1	90	1	40
Happer, Happer & Co.		1	10	1	8
TAYLORSTOWN.					
D McMannis, W Va Nat Gas Co.		1	55	1	55
J McMannis, "		1	100	1	82
Noble, "		1	170	1	166
Donohy, "		1	1	1	106
Carson, "		1	1	1	6
Flack, "		1	1	1	300
Blayne, Marshall Oil Co.		2	227	2	290
Woodburne, F O Co & Craig.		1	216	1	220
Cundall, Vandergrift, Reed & Aiken.		1	140	1	60
Total		187	7361	190	8923

Date.	No. of wells.	Production Barrels.
June 11, 1887.	187	7361
July 16, 1887.	190	8925
Increase.	3	1564

THE third and last test well drilled in the Knowersville region was located near Knox, about 20 miles west of Albany. Drilling stopped at 3012 feet. The Trenton rock was found at 2900 feet; it contained neither oil nor gas. A small quantity of gas was found in a limestone formation at about 600 feet, which is sufficient to make a five-foot flame at the mouth of the well.

Bradford's New Gas Line.

The Manufacturers' Gas Co., of which that renowned hustler, T. N. Barnsdall, is President, J. L. Seyfang, Vice-President, and A. W. Lewis, Secretary and Treasurer, are making a thorough canvas of the city to secure the contracts for gas service which will give them a guarantee for building a line from the great gassers in the vicinity of Kane to Bradford. It will afford the friends of honorable competition and cheap gas no little satisfaction to learn that the Manufacturers' company is meeting with success, and at this writing, July 19, has made contracts with consumers which will afford a revenue of more than \$4000 per month. The company hopes to secure contracts for a business of \$6000 per month; but with a fair share of the business of the city will construct the line. With the contracts for the gas service in hand, the Manufacturers' company do not doubt their ability to secure the capital required for the enterprise. The following is the prospectus of the company:

In bringing the matter of a gas supply before the citizens of Bradford and Kendall, we shall enter into no lengthy, wordy or high-flown treatise of the subject, but will, as shortly and concisely as possible, state the facts of the case.

We have secured sufficient territory in the Kane field (see map on file at our office) to ensure a permanent supply of gas; we shall, however, add to the territory from time to time, so that the supply for future use, even with the increased demand from manufacturers, will be unquestioned.

We shall apply for an increase to our capital stock, with which to pipe Bradford and Kendall and run the line to Kane, and secure additional territory, and if we can obtain sufficient subscriptions to said increase of stock the line will be put through and the two towns piped in time for the fall trade.

We desire to sell one share of stock for each stove service, and also to contract with consumers to supply them with gas for at least three years to come at our present rates, viz.: \$2.00 per month for cooking stoves, \$1.63 per month for heating stoves, 15 cents per month for lights in dwellings, and 20 cents per month for lights in stores—monthly rate per year, and in this way to as nearly as possible form a "Citizens' Company" for carrying on the business and furthering the interests of the two towns.

The stock is to be non-assessable above par, and the terms of sale as follows: 20 per cent. to be paid at the time the stock is subscribed for; 20 per cent. 3 months from the date of closing the subscription books, and 20 per cent. each 3 months thereafter, until, if necessary, paid in full.

The payment, at the time of subscribing, to be made to A. W. Lewis, whom we have appointed to act as trustee, and who will, in 60 days from this date, return all moneys paid in on stock subscriptions, if at that time a sufficient amount of stock is not subscribed for to warrant the going ahead with the line.

At such a time as the second assessment on the stock shall be paid in full, the subscribers thereto shall have the right to call a meeting of the stockholders to elect a suitable number of members from among themselves to form a committee to fix a price for gas service to any or all new manufactories that can be induced to locate here.

It is impossible to obtain an adequate supply of gas short of the Kane field, and it therefore "goes without saying" that unless the citizens of Bradford and Kendall will avail themselves of this opportunity they will in the future, as in the past, have to see the large revenue

monthly derived from the sale of gas in the two towns going to foreign seaports, instead of staying here as it should.

It is also without doubt a fact that "the powers that be" will, unless the line goes through, hold the rates at least at present figures.

The only question now is, are you ready? and will you take hold of this matter, and from this time out have the gas business in your own hands so that it can be conducted for the best interest of the two places.

Several gentlemen who have interested themselves in the matter will at once thoroughly canvass Bradford and Kendall to take contracts for gas service, and we earnestly request that you give the matter your prompt attention, as we believe that this is a move which is of vital importance to all.

Other towns and cities are waking up and taking cognizance of their natural advantages, and we believe that in Bradford we have a city which is fully equal to any, and being the farthest east on the natural gas belt and having good railroad facilities, that if her citizens now take advantage of this plan, and speedily and at once put it through, they will in a short time have a flourishing and prosperous city of twice its present size.

Bradford has the railroad facilities and many natural advantages; give her the gas and she can offer superior inducements to eastern manufacturers to locate here, and if this stock is subscribed for, the company will agree to have the line laid and both towns piped within 90 days from the time the subscription books are closed, at which time you can take the matter of offering inducements to manufacturers of goods for the Eastern market into your own hands, and if your committee does its work well there is no question but that in the natural gas business the history of the last year will repeat itself, and that the owners of property in Bradford and Kendall will, inside of one year from this date, by the natural increase in the value of their property, be paid back many times the amount they have invested in the gas business, besides thereafter receiving a handsome interest on the amount invested.

Don't wait for others, but call at our office and convince yourself that it will be for your best interest to contract with the "new company" for your gas service, and also that it will pay you to subscribe to the stock.

MANUFACTURERS' GAS CO.,
Of McKean Co., Pa.

Zoar.

The well of Sill & Co. on the Coon farm, northeast of the Ohio Valley Gas Co.'s well on the White farm, has been shut down at some depth not yet made public, and is maintained in the same condition as the former mystery on the White farm. If the people who have drilled these two wells have a good thing they are in no hurry to glean untold wealth from it. Up the Cattaraugus Creek on lot 29, and on the south side of the creek, Frederick & Co., of Buffalo, have a well drilling. Drilling is progressing at Roth, Pepper, Jennings & Dyer's well at Snyder's Corners, in Persia township.

THE Chartiers Valley Natural Gas Co. has increased its capital stock from \$3,000,000 to \$4,000,000, and will increase the capacity of its pipe to 200,000,000 cubic feet a day. It expects to have 36 producing gas wells for its winter supply.

A SCHEME is on foot to supply natural gas to Chicago from the great gassers at Fairmont, Ind. Dan O'Day and the Standard are said to be behind it.

LIMA OIL.

OFFICIAL REPORT OF ITS ILLUMINATING VALUE.

At the producers' meeting, held in Lima June 29, a committee of three, consisting of Geo. P. Waldorf, and John B. Kerr, of Lima, and J. Rumsey, of North Baltimore, were appointed to call upon the Standard officials and obtain from them an official statement of the percentages of products from Lima crude oil. The committee called upon the officers as required, but the Standard people asked for time in which to ascertain and make reply to the questions propounded, which were as follows:

To Daniel O'Day, representing the Solar Refining Company, the Buckeye Pipe Line Company, the Standard Oil Company:

DEAR SIR:—The undersigned committee selected by the producers of the Ohio oil field for the purpose set forth in the following questions, respectfully request information as follows:

First. What are the percentages you can derive from Lima crude, as ascertained at Cleveland and the Solar refinery, of various products.

1st. benzine, light and heavy; 2d, 150°, refined (water white); 3d, 110°, export; 4th, paraffine; 5th, of other products.

Second. In case you personally cannot give the information, will you direct Mr. Van Dyke, manager of the Solar refinery, to give same.

Third. In case any producer or producers make sale of their oil, will you allow the use of your cars to ship same in, you receiving pipeage for same and customary compensation for use of cars?

The following answers to the above questions were received by the committee, July 8, from Mr. O'Day, General Manager of the National Transit Company, and a proper authority of the Standard Company.

NATIONAL TRANSIT COMPANY, GENERAL OFFICE, }
ROOM 89, 26 BROADWAY, N. Y., }
OFFICE OF GENERAL MANAGER, }
BUFFALO July 7, 1887.

Messrs. G. P. Waldorf, J. B. Rumsey and John B. Kerr, Committee, Lima, Ohio:

GENTLEMEN:—In reply to the question asked by your committee on the 29th ult., I have to say after diligent inquiry, that with regard to the percentage of products derived from Lima crude, I learn that the efforts of the Standard Oil Company refiners, not only in Cleveland and Lima, but at the numerous other points where test runs were made, have been directed exclusively toward obtaining an illuminating oil of a satisfactory quality, i. e., such as would fairly compete with that obtained from Pennsylvania oils. This has seemed to our experts the chief and really first question to be solved, the matter of percentages being subordinate and therefore neglected. The result of the numerous, extensive and very costly experiments conducted is, as we stated to you in person, a complete and utter failure. Up to this time no oil has been produced from Lima crude which, either by the test of experts, or by the crucial test of sale in open market, can safely be put on the market as an illuminant.

In reply to your further inquiry: "In case any producer or producers make sale of their oil, will you allow the use of your cars to ship the same in, you receiving pipeage for same, and customary compensation for use of the cars?" I have to say that after correspondence with the Union Tank Line, I am authorized to answer, yes, so far as the question relates to the use of

the cars. While so far as the question relates to the Buckeye Pipe Line Company, I answer, as I did to you personally at the interview at which your inquiries were presented, that we would be delighted to deliver every barrel of oil we hold to the order of any owner, and that we would use every possible effort to make the delivery at such points as might be desired, regardless of where the oil itself was actually received into our custody.

Very truly yours,
DANIEL O'DAY, General Manager.

New Refineries.

A large refinery is soon to be erected near Bradford. No place in the world can present better facilities. Gas is offered at Pittsburgh rates. Prospects for a large supply of crude for years to come are of the best. Pipe lines can be laid at an inconsiderable expense to secure crude oil, less the 20 cents a barrel pipeage charges. Transportation facilities are unsurpassed and the markets of the world can be reached as cheaply as from any other point.

The Standard Oil Co. is building a large refinery on the line of the Pittsburgh & Western Railroad in Clarion county, between Tylersburg and Marienville. Producers whose attention has been attracted by it are wondering what the company is going to do with it. It is thought by some that it will be used expressly for Clarion, Kane and Elk county oils, while others think they are going to refine all the Lower country oil at this refinery. They are putting in seven boilers and have three 25,000-barrel tanks in course of construction and are also putting in numerous stills. This refinery is located on the Butterfield farm.

Contracts have been let for the erection of a large independent oil refinery for the Pittsburgh Refining Co., in the Eighteenth ward, Pittsburgh. The company, which is a partnership concern, comprises among its members W. H. Elkins, P. H. Widener, of Philadelphia, and David P. Reighard, late of the Empire Oil Works, which was sold out about six months ago to the Standard. The new works will have a capacity of 12,000 barrels per week, and will also engage in the manufacture of electric light carbons, having merged with the new concern a one-half interest of the Empire Carbon Company, of which Mr. Reighard was heretofore sole owner. Mr. Reighard will be general manager of the new works. The Empire is the only carbon works not in the recently organized carbon works pool. The new refinery will control an independent pipe line from the oil region to its works, putting it on an equal advantage with the Standard. The work of erecting the new refinery will be commenced in a few days and pushed rapidly to completion. The capital of the new company will be in the millions.

The International Oil Co. of Titusville will add to their transportation facilities ten new tank cars during the current month. They will be similar in style and finish to the ten already owned by that company, and will be constructed by the Harrisburg Car Co., the company that builds the Green Line's tank cars, and has recently completed 300 for the B. & O. R. R.

The firm of Rice, Robinson & Witherop finds itself unable with its present capacity to supply its patrons and meet the demand for its oils. It has therefore begun the construction of a 900-barrel still, the foundation of which has already been completed and work upon the still proper will be begun soon. The company will also increase its storage capacity by the addition of two "bleecher" tanks 40x9 feet and capable of holding 2000 barrels.

*Origin of Young's coal oil works.

Crude Market for June.

The crude market continued dull and sluggish and prices ranged on a lower plane in June than in May. Outside speculators are content to leave the petroleum certificates severely alone and business on the Exchange floors is very quiet. The field reports show an increase in the amount of new production, which, though known to be of momentary duration, exercises somewhat of a depressing influence. The low rates of carrying ought to prove inviting to investors after a time, but their past experience has made them over-cautious, and nothing short of a marked change in the present situation will again induce them to take hold of the crude market. The statistical situation cannot be considered otherwise than favorable to the long side, but anything like concerted action for a bull movement appears to be a long ways ahead.

The opening quotations for June were at 63¼@63½c. The market remained between 63½c and 62½c until the 13th, when there was an advance to 64½c, which was the highest point of the month. A general weakening of values again set in which continued, amid many fluctuations, until the close of the month. On the 28th oil sold at 60½c on the floor of the New York Exchange, which was the lowest price for the month. There was a reaction immediately afterward to 62¼c, and the month closed with 61¾c bid at all the Exchanges. The highest price for May was 67¼c and the lowest 61½c, while the April fluctuations were between 69c and 62½c.

The range of prices for June was 3½c as compared with 5½c in May, 6½c in April, 4c in March 9¾c in February, and 4¾c in January. The average price on the floor of the Bradford Exchange was 62½c in June, 64c in May, 64½c in April, 63¼c in March, 63¾c in February and 71c in January. The average price for June one year ago was 67c.

The general apathy that prevails in the crude market is best shown in the volume of clearances, which for June were the lowest in the history of the business.

THE CLEARANCES.

	June. Barrels.	May. Barrels.
Bradford Oil Exchange.....	8,536,000	14,868,000
Oil City ".....	22,614,000	33,828,000
New York Consolidated Exchange.....	68,410,000	91,328,000
Pittsburgh Petroleum Exchange, est.....	23,063,000	36,549,000
Philadelph. Oil Exchange, est.....		
Total.....	122,628,000	176,573,000

Notes on Early History of Petroleum and the Kerosene Lamp.

It was in the year 1841 that the prophecy of the great Leibig concerning the future of mineral oils and their products was known to the world, and only a few years elapsed before this prophecy was literally fulfilled.

In the year 1847 Professor Lyon Playfair accidentally discovered the basis of petroleum in the form of a thick, dark, oily fluid trickling from some rents in a coal mine near Atherstone, in Warwickshire, and close upon this discovery means were found for producing artificially a similar oil, first as a lubricant, then as a luminant, and finally as a solid, to be "burned on a candlestick." The Professor soon found that this substance, which was allowed to run to waste, contained valuable properties. He communicated the result of his observations to Mr. James Young, of Glasgow, and encouraged him to conduct experiments with a view to testing the qualities of this crude and mysterious liquor, and the result of these experiments far exceeded his expectations. A small manufactory was established in Derbyshire for distilling burning and lubricating oils from the coarse petroleum issuing from the coal mines, and subsequently "made

into a substance, solid, inodorous, portable, and capable of being placed on a candlestick."

It was found that this crude petroleum was the natural result of the slow distillation of coal by means of subterranean heat, and after two years' perseverance and investigation, nature was superseded by art. A material was found, and by its distillation at a low temperature, a crude oil, having all the properties of the natural material, was produced.

In 1850 a mineral rich in oil was discovered near Bathgate, in Linlithgowshire, and in the following year Mr. Young established the "Bathgate Paraffin Works," which in a few years converted a small weaving village with a population of 3000 into an industrious hive of upwards of 10,000. Thus were "Petroleum and its Products" discovered, and the next question was, "How to produce suitable lamps to burn the oil successfully, and to render it commercially valuable."

Soon after the discovery of the crude oil I obtained samples of it in a partially refined state, and, after numerous trials and experiments, I succeeded in producing a lamp with a flat wick to burn this partially refined mineral oil with some degree of satisfaction, and I was at the time credited with the honor of having produced the first English mineral oil lamp, the main features of which are adopted, with a slight variation of contour or arrangement of parts, in the present day. This lamp consisted of a flat metallic wick tube, within which the wick was raised and lowered by means of a simple lever; the atmospheric air was supplied to the flame by means of an elliptical deflector (now called a conc), and the motion of the air was facilitated by the employment of a glass chimney. This was called the "Oxydate lamp," and by reference to the most improved lamps of the present day these features will be apparent. My inventions in relation to "improvements in lighting and heating" were exhibited at the great International Exhibition in 1851. They were also fully illustrated and described in the *Magazine of Science*, in 1850, and other scientific publications.

Camphene is a vegetable spirit, obtained by the distillation of turpentine, the produce of the pine tree. The camphene lamps were upon the Argand or circular wick principle, with the addition of a deflector to spread the flame and secure the more complete combustion of the carbon contained in the spirit. Argand's lamp was originally made to burn vegetable and animal oils.—*James Syson Nibbs in Oil and Colorman's Journal.*

June Production Report.

Reports of stocks at wells received by THE PETROLEUM AGE show an average decrease of 2.1 barrels to the well in the Bradford and of 4.5 barrels to the well in the Allegany field during the month of June. The total number of wells connected with the pipe lines July 1st is estimated at 14,085 in the Bradford and 4000 in the Allegany field. Taking the above figures as the basis of an estimate on the daily production, stocks in tanks at wells were decreased at the rate of 989 barrels a day in the Bradford and 600 barrels a day in the Allegany field. The total daily pipe line runs in both fields averaged 27,926 barrels a day in June. Subtracting the reduction in stocks, the Bradford and Allegany production averaged 26,337 barrels a day in June, which may be placed at 4,337 barrels a day for the Allegany and 22,000 barrels a day for the Bradford field. There were 13,533 barrels of oil shipped from the Bradford field in June by L. Emery, Jr., & Co. independent of the pipe lines.

THE MAY REPORT.

The stocks at wells were reduced during May at the

rate of 1.7 barrels to the well in the Bradford and of 3.6 barrels to the well in the Allegany field. The total number of wells connected with the pipe lines June 1st was estimated at 14,065 in the Bradford and 4000 in the Allegany field. Taking the above figures as the basis of an estimate on the daily production, stocks in tanks at wells were decreased at the rate of 804 barrels a day in the Bradford and 465 barrels a day in the Allegany field. The total daily pipe line runs by both lines averaged 27,764 barrels a day in May. Subtracting the reduction in stocks, the Bradford and Allegany production averaged 26,495 barrels a day in May, which may be placed at 4500 barrels a day for the Allegany and 21,995 barrels a day for the Bradford field.

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

Field.	No. Wells June 1.	No. Wells July 1.	Average per well June 1.	Average per well July 1.
Clarendon and Tiona	65	66	26	20
Cherry Grove	22	22	41	42
Cooper District	106	106	40	32
Lower Country	173	174	99	96
Miscellaneous	193	195	70	69

Accepting the outside runs, which are made up of the producing fields outside of Bradford and Allegany, as representing the production outside of those two fields, an estimate on the yield for June and May is as follows:

Field.	June. Barrels.	May. Barrels.
Bradford	22,000	21,995
Allegany	4,337	4,500
Outside Runs	35,938	36,758
Total	62,275	63,253
Macksburg	1,010	970
Total with Macksburg	63,285	64,223
Decrease per diem	938	---

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region, with the exception of Bradford. The Lima runs by the Buckeye Pipe Lines were 15,818 barrels a day in June, 14,486 barrels in May, 11,760 barrels in April, 9777 barrels in March, 7394 barrels in February, 4226 barrels in January, 4374 barrels in December, 4038 barrels in November and 4112 barrels in October.

The following table shows the comparative production for 1884, 1885, 1886 and 1887:

	Bradford.		Allegany.		Outside Runs.		Total Prod.	
	1885.	1884.	1885.	1884.	1885.	1884.	1885.	1884.
January	28,675	31,806	8,260	11,264	18,594	16,140	55,529	59,240
February	27,051	32,378	7,196	11,607	19,800	18,561	54,047	62,546
March	26,444	31,912	7,342	11,768	19,923	19,764	53,709	63,444
April	27,413	32,442	7,169	11,848	23,067	19,162	57,649	63,452
May	27,231	33,922	7,049	11,547	21,225	19,549	55,505	65,018
June	29,272	33,753	7,463	11,108	21,559	19,977	58,294	64,838
July	30,309	34,031	7,139	11,218	19,273	20,870	56,721	66,119
August	29,858	33,353	7,065	10,384	18,608	22,830	55,531	65,567
September	30,205	32,976	7,186	9,877	21,269	22,514	58,660	65,367
October	30,180	31,758	6,747	9,356	23,161	22,762	60,088	63,876
November	31,355	31,789	7,002	8,642	23,087	23,557	61,444	63,988
December	29,223	29,516	6,196	8,193	24,184	22,918	59,603	60,297
January	1886.	1885.	1886.	1885.	1886.	1885.	1886.	1885.
January	28,677	28,675	6,378	8,260	22,217	18,594	57,272	55,529
February	28,586	27,051	6,651	7,196	22,603	19,800	57,840	54,047
March	27,947	26,444	6,137	7,342	25,680	19,923	59,764	53,709
April	27,807	27,413	6,527	7,169	28,693	23,067	63,027	57,649
May	27,148	27,231	6,535	7,049	34,515	21,225	68,198	55,505
June	27,860	29,272	6,554	7,463	40,040	21,559	74,454	58,294
July	27,046	30,309	6,350	7,139	40,491	19,273	73,887	56,721
August	26,695	29,858	6,200	7,065	43,762	22,830	76,657	55,531
September	26,674	30,205	5,994	7,186	45,560	21,269	78,228	58,660
October	25,454	30,180	6,017	6,747	45,538	23,161	77,009	60,088
November	24,503	31,355	5,800	7,002	40,817	23,087	71,180	61,444
December	22,422	29,223	5,178	6,196	38,783	24,184	66,383	59,603
January	1887.	1886.	1887.	1886.	1887.	1886.	1887.	1886.
January	23,269	28,677	5,563	6,378	34,254	22,217	63,086	57,272
February	22,930	28,586	5,049	6,651	35,745	22,603	63,724	57,840
March	22,327	27,947	4,930	6,137	36,135	25,680	63,392	59,764
April	21,880	27,807	4,447	6,137	37,120	28,693	63,447	63,027
May	21,995	27,148	4,500	6,535	36,758	34,515	63,253	68,198
June	22,000	27,860	4,337	6,554	35,938	40,040	62,275	74,454

The Refined Market.

Refined quotations remained steady at 6½c for 70° Abel test throughout the month. Some shippers still expect a mark down to 6¼c, in sympathy with the low state of crude. Freight rates have been advanced and continue firm at 2@2s. 6d. for Continental and London ports. The exports for the first six months of the present year are very nearly the same as those of the first six months of 1886.

Wm. H. Samuel & Co., of Liverpool, under date of June 11, say:

"We have to record this month a continuance of extremely low prices both for crude and refined oils in every position, although there has certainly been a slight improvement lately, and owing to a considerable advance in the rates of freight for the opening months of the season, there has been a decided upward movement in future quotations. As the prime cost of refined oil becomes less, the question of freight becomes more and more an important factor, and the fluctuations in freight, caused by the scarcity or otherwise of vessels, has of late had a great deal to do with the course of prices here.

"Should freights continue at what they now promise to be, there must necessarily be a higher range of prices before long, unless refiners make some concession, of which there does not now appear the slightest prospect. As an indication of what the position of the freight market is likely to be, it may be mentioned that notwithstanding the higher rates that are quoted for August shipment from the United States, there are hardly any sailing vessels now loading or to load here for the United States ports, and if the higher rates fail to attract vessels from here the inference is that they will also fail to attract them from other ports, and in the absence of abundance of vessels, freights will be maintained and advanced upon.

"The available supply of refined oil in home ports is very much the same as last year, and one-third of the present stock held in Liverpool is Russian oil. Russian oil, although offered at considerably below prices of American oil, makes very little headway into the consumptive demand, and its principal function appears at present to be that of keeping down the value of American oil."

The exports of refined, crude and naphtha, from all ports, from January 1 to July 2 have been as follows:

	1887. Gallons.	1886. Gallons.
From Boston	2,396,080	2,868,733
Philadelphia	76,910,402	71,227,188
Baltimore	3,917,389	6,913,321
Perth Amboy	8,272,163	1,593,770
Total	91,496,034	82,603,012
From New York	185,490,689	195,236,122
Total exports from United States	276,986,723	277,839,134

Refined for the home trade is very dull at this season and prices are as follow: 8¼@8½c for New York State legal test, 7@7¼c for 110° test, 8@8¼c for New York city 110° flash, and 8½@9c for New York city 150° water white. Western lots are offered at 6¾@7c for 110° test Standard white, 7¼@7½c for 120° test Standard white, 7½@7¾c for 130° test Standard white, and 8¼@8½c for 150° test water white. Western naphtha 68° to 72° test is quoted at 7½@8c delivered in New York.

Refined in cases continues in fair demand on a basis of 8½c for plain tops. The clearances for June in this class of goods to China and the East amounts to 1,084,921 cases, a decrease of 336,441 cases from the same month in 1886. The total clearances to June 30, 1887, are 5,602,528 cases, a decrease of 2,081,964 cases, as compared with the corresponding period of the year preceding.

Mr. George H. Lincoln's monthly circular gives the following figures on the clearances of refined petroleum, in cases, for China and the East up to the 30th of June, for the years 1886 and 1887:

	1887. Cases.	1886. Cases.
China.....	1,027,058	2,316,507
Japan.....	1,419,983	1,088,254
India.....	1,683,892	2,345,563
Java, Singapore, etc.....	1,471,595	1,944,168
Total May 31st.....	5,602,528	7,684,492
Total April 30th.....	4,517,607	6,213,130
Clearances for June.....	1,084,921	1,471,362
Clearances for May.....	949,574	1,112,522
Clearances for April.....	1,085,363	742,478
Clearances for March.....	1,157,823	2,058,609
Clearances for February.....	733,626	1,281,488
Clearances for January.....	591,221	1,018,033
Total.....	5,602,528	7,684,492

REFINED QUOTATIONS FOR JUNE.

	New York	Philadelphia	Baltimore	London and Liverpool	Bremen	Antwerp
	Cts.	Cts.	Cts.	Pence.	Marks.	Francs.
1.....	6 3/8	6 3/8	6 3/8	5 1/2	6.05	15
2.....	6 3/8	6 3/8	6 3/8	5 1/2	6.05	15
3.....	6 3/8	6 3/8	6 3/8	5 1/2	6.05	15
4.....	6 3/8	6 3/8	6 3/8	5 1/2	6.00	15
5.....	6 3/8	6 3/8	6 3/8	5 1/2	6.00	15
6.....	6 3/8	6 3/8	6 3/8	5 1/2	6.00	15
7.....	6 3/8	6 3/8	6 3/8	5 1/2	6.00	15
8.....	6 3/8	6 3/8	6 3/8	5 1/2	6.00	15
9.....	6 3/8	6 3/8	6 3/8	5 1/2	5.95	15
10.....	6 3/8	6 3/8	6 3/8	5 1/2	5.95	15
11.....	6 3/8	6 3/8	6 3/8	5 1/2	5.95	15
12.....	6 3/8	6 3/8	6 3/8	5 1/2	5.95	15
13.....	6 3/8	6 3/8	6 3/8	5 1/2	5.95	15
14.....	6 3/8	6 3/8	6 3/8	5 1/2	5.95	15
15.....	6 3/8	6 3/8	6 3/8	5 1/2	5.95	15
16.....	6 3/8	6 3/8	6 3/8	5 1/2	6.00	15
17.....	6 3/8	6 3/8	6 3/8	5 1/2	6.00	15
18.....	6 3/8	6 3/8	6 3/8	5 1/2	6.00	15
19.....	6 3/8	6 3/8	6 3/8	5 1/2	6.00	15
20.....	6 3/8	6 3/8	6 3/8	5 1/2	6.60	15
21.....	6 3/8	6 3/8	6 3/8	5 1/2	6.60	15
22.....	6 3/8	6 3/8	6 3/8	5 1/2	6.60	15
23.....	6 3/8	6 3/8	6 3/8	5 1/2	6.60	15
24.....	6 3/8	6 3/8	6 3/8	5 1/2	6.60	15
25.....	6 3/8	6 3/8	6 3/8	5 1/2	6.60	15
26.....	6 3/8	6 3/8	6 3/8	5 1/2	6.60	15
27.....	6 3/8	6 3/8	6 3/8	5 1/2	6.00	15
28.....	6 3/8	6 3/8	6 3/8	5 1/2	6.00	15
29.....	6 3/8	6 3/8	6 3/8	5 1/2	6.00	15
30.....	6 3/8	6 3/8	6 3/8	5 1/2	6.00	15

SUMMARY of the Statements of the National Transit Company for May and June:

	June. Barrels.	May. Barrels.
Receipts from all sources.....	1,688,785.15	1,767,448.13
Deliveries.....	1,798,010.52	2,065,913.79
Gross stocks end of month.....	32,884,448.83	32,889,159.25
Sediment and surplus.....	4,152,801.13	4,043,054.03
Total liabilities end of month.....	28,731,647.70	28,846,105.22
Outstanding acceptances.....	21,697,036.33	22,091,036.33
Credit balances.....	7,034,611.37	6,755,068.89

The above "receipts from all sources" for June were made up as follows:

Runs from wells.....	1,314,078.29
Received from other lines.....	374,706.86
Received in iron tanks.....	
Total.....	1,688,785.15

The above "total deliveries" for June were made up as follows:

Regular shipments.....	1,760,679.00
Delivered to other lines.....	37,331.52
Total.....	1,798,010.52

The above "receipts from all sources" for May were made up as follows:

Runs from wells.....	1,376,834.96
Received from other lines.....	390,613.17
Total.....	1,767,448.13

The above "total deliveries" for May were made up as follows:

Regular shipments.....	1,880,588.58
Delivered to other lines.....	185,325.21
Total.....	2,065,913.79

FIELD OPERATIONS SUMMARIZED.

WELLS COMPLETED, WITH THE ESTIMATED PRODUCTION ON THE LAST DAY OF THE MONTH.

ALLEGANY FIELD.

Division of Field.	JUNE, 1887.			MAY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Seio.....	1	5	0	1	5	0
Alma.....	0	0	0	0	0	0
Wirt.....	3	19	0	0	0	0
Bolivar.....	0	0	0	1	3	0
Clarksville.....	3	9	1	0	0	0
Genesee.....	0	0	0	0	0	0
Miscellaneous.....	0	0	0	1	0	1
Total.....	7	33	1	3	8	1

BRADFORD FIELD.

Division of Field.	JUNE, 1887.			MAY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
E. and W. Branches.....	6	38	0	3	9	1
Kendall Creek.....	5	36	0	3	18	0
Foster Brook.....	1	8	0	0	0	0
Knapp's Creek.....	2	10	0	1	6	0
Four Mile.....	0	0	0	1	8	0
Indian & Meeks Creeks.....	3	22	0	3	19	0
Cole Creek.....	1	15	0	2	10	1
Kinzua.....	4	51	0	2	16	0
Miscellaneous.....	0	0	0	0	0	0
Total.....	22	180	0	15	86	2

WARREN AND FOREST.

District.	JUNE, 1887.			MAY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Glade.....	12	832	3	12	350	4
Clarendon.....	12	60	0	12	58	0
Tiona.....	7	42	0	6	33	0
Cooper.....	0	0	0	0	0	0
Balltown.....	1	10	0	2	20	0
Kane.....	1	10	0	2	6	1
Grand Valley.....	27	137	4	19	164	3
Miscellaneous.....	9	82	2	11	90	3
Total.....	69	1173	9	64	721	11

LOWER COUNTRY.

District.	JUNE, 1887.			MAY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Venango.....	32	173	7	26	138	7
Clarion.....	3	7	1	10	45	7
Butler and Armstrong.....	36	1861	15	19	1479	7
Washington.....	10	2553	2	8	505	1
Shoustown, Etc.....	0	0	0	1	200	0
Total.....	81	4994	25	64	2367	22

GRAND SUMMARY.

District.	JUNE, 1887.			MAY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Allegany.....	7	33	1	3	8	1
Bradford.....	22	180	0	15	86	2
Warren and Forest.....	69	1173	9	64	721	11
Lower Field.....	81	4994	25	64	2367	22
Total June.....	179	6380	35	146	3182	36
Total May.....	146	3182	36			
Difference.....	33	3198	1			

Rigs Up and Building—Wells Drilling.

ALLEGANY FIELD.

Division of Field.	JUNE 30, 1887.			MAY 31, 1887.		
	New Rigs.	Old Rigs.	Total.	New Rigs.	Old Rigs.	Total.
Seio.....	1	4	5	0	4	4
Alma.....	0	0	0	0	0	0
Wirt.....	1	1	2	0	2	2
Bolivar.....	0	2	2	0	2	2
Genesee.....	0	2	2	0	2	2
Clarksville.....	1	5	6	2	3	5
Miscellaneous.....	0	0	0	0	0	0
Total.....	3	31	37	2	33	40

BRADFORD FIELD.

Division of Field.	JUNE 30, 1887.			MAY 31, 1887.		
	New Rigs.	Old Rigs.	Total.	New Rigs.	Old Rigs.	Total.
E. and W. Branches.....	1	8	9	1	8	9
Kendall Creek.....	3	0	3	3	3	6
Knapp's Creek.....	0	3	3	3	2	5
Foster Brook.....	1	4	5	1	4	5
Four Mile.....	0	3	3	4	0	4
Indian Creek.....	1	1	2	1	2	3
Cole Creek.....	0	5	5	1	1	2
Kinzua.....	3	0	3	0	4	4
Miscellaneous.....	0	0	0	0	0	0
Total.....	9	24	33	11	24	35

WARREN AND FOREST.

Division of Field.	JUNE 30, 1887.				MAY 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Glade	6	0	4	12	6	0	5	11
Clarendon	3	5	3	19	3	5	7	17
Tiona	3	0	3	6	3	1	6	10
Cooper	0	2	1	3	0	2	1	3
Balltown	1	2	2	5	1	2	0	3
Kane	0	3	1	4	1	3	1	5
Grand Valley	8	5	4	17	9	3	13	25
Miscellaneous	6	0	6	12	7	3	8	18
Total	32	17	29	78	32	19	41	92

LOWER COUNTRY.

Division of Field.	JUNE 30, 1887.				MAY 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Venango	13	14	15	42	15	11	17	43
Clarion	3	7	6	16	3	7	2	12
Butler & Armstrong	5	8	38	51	12	4	48	64
Washington	2	3	25	30	5	6	23	34
Shoustown, Etc.	0	4	6	10	1	3	9	13
Total	23	36	90	149	36	31	99	166

GRAND SUMMARY.

Field.	JUNE 30, 1887.				MAY 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Alleghany	3	31	3	37	3	33	5	40
Bradford	9	24	16	49	11	24	16	51
Warren and Forest	32	17	29	78	32	19	41	92
Lower Country	23	36	90	149	36	31	99	166
Total	67	108	138	313	81	107	161	349
Total May 31.	81	107	161	349				
Difference	14	1	23	36				

Comparative Statement.

STATISTICAL SUMMARY OF THE PETROLEUM SITUATION.

	1887. June.	1886. June.
Wells completed	179	372
New production	6,380	9,027
Dry holes	35	56
New rigs	67	198
Old rigs	108	143
Drilling wells	138	402
Total field operations	313	743
Average daily pipe line runs	63,413	75,811
Average daily shipments	68,329	71,017
Total stocks custody pipe lines	31,459,464	32,872,309
THE MARKET.		
Refined in New York	6½%	7½%
Opening price of crude for the month	63¼%	62¼%
Highest price of crude for the month	64½%	71
Lowest price of crude for the month	60½%	62¼%
Closing price of crude for the month	61¾%	67¾%
Average price of crude for the month	62½%	67

Bradford's Independent Pipe Lines.

Whitney & Wheeler have their pipe line connected with 60 of their wells on the farms below Mount Raub and the flats along the East Branch, and are shipping oil via the Buffalo, Rochester & Pittsburgh R. R. to independent refiners at Buffalo and Philadelphia. They made their first shipment to Philadelphia on the 14th of July. Emery & Weaver report everything moving smoothly with their pipe line work and are pleased with their new departure. They saved the pipage on 13,533 barrels of oil in the month of June. A large amount of Bradford crude is wanted at the seaboard and at other points, and there is still room for more independent pipe lines in the Northern field.

THE steamer Vincent makes the run from Jamestown to Mayville, on Chautauqua Lake, using crude petroleum for fuel in place of coal. It is claimed that with the invention of Frank Lily a barrel and a half of crude answers the same requirements as a ton and a half of coal.

Better Late Than Never.

The determined move on the part of the Manufacturers' Gas Co. for a new line to Kane has caused a mighty wave of generous feeling to convulse the frame of President Hequembourg and in the past few days he has published to the world that he will furnish gas at Pittsburgh prices to manufacturers who will locate in Bradford. Below is his letter to the Bradford Board of Trade with the reply from President Whitehead:

BOARD OF TRADE ROOMS,
BRADFORD, Pa., July 11, 1887.

The Board of Trade of the city of Bradford have received the following important letter regarding the future interests of the city from the Bradford Gas Light and Heating Company which explains itself. It is a fine offer and from a corporation that has the gas and means to carry out all it undertakes. Bradford can now take a bold stand in asking manufacturers to locate here, as no city in the country can offer better inducements.

C. H. KENNEDY, Secretary.
C. B. WHITEHEAD, President.

BRADFORD, Pa., July 11, 1887.

To the Board of Trade of the City of Bradford, Pa.:

* * * * Believing that the advantages presented by Bradford are superior to Pittsburgh, or any locality in this State, for manufacturing purposes, and realizing to its fullest extent the necessity and advantages of a permanent supply of cheap natural gas in the manufacturing of iron, wood, glass, oil and all other kindred establishments, the Bradford Gas Light and Heating Co. have recently acquired an unlimited supply of natural gas for all of the above purposes, and it hereby proposes to all persons, partnerships and corporations of every kind desiring to engage in any of the branches of business above mentioned, in the city of Bradford, to furnish an abundant supply of natural gas for such purposes at prices not exceeding those charged to the most favored manufacturing establishments in the city of Pittsburgh; and this company hereby proposes to enter into contracts accordingly for terms of years, and manufacturers now in Bradford will not be permitted to suffer by any discrimination in rates given to new establishments. And we hereby assure you that for all individuals and families coming to this city to engage in business as stated, as well as those now residing here, that gas will be supplied in the future at rates not exceeding present prices, with every probability of continued decrease as the growth of the city shall warrant, and contracts for terms of years will be made accordingly. Having unlimited confidence in the future of Bradford, with a never failing supply of natural gas, we shall do everything in our power to advance her material interests, and have determined that its growth and future shall not be retarded for the want of a cheap and abundant supply of this great natural product.

The Bradford Gas Light and Heating Company, by its President.
C. E. HEQUEMBURG.

New Partnership.

The host of friends of Henry S. Wilson, for several years bookkeeper for S. G. Bayne, will be pleased to learn that his former chief has admitted him to partnership and the firm will be hereafter styled Bayne & Wilson. After having disposed of over 12,000 of the celebrated Farrar & Treft engines, boilers galore, and thousands of miles of tubing and pipe, General Agent Bayne has earned a well-merited rest from active business and will live in New York on the completion of his residence now under way on Riverside drive. His genial junior partner will greet the noble producer in the old-time way at their new office in the Oil Exchange building and accept collateral and guarantee our machinery as of yore.

Stocks Abroad.

Reports of stocks in London, and the seven principal Continental ports, are summarized in the following statement:

STOCKS AFLOAT AND ASHORE.	June 25, 1887.	May 28, 1887.
Seven Continental Ports.....	Barrels. 1,067,272	Barrels. 815,608
London.....	220,179	161,492
Total Stocks afloat and ashore.....	1,287,451	977,100
Increase in stocks since May 28.....	310,350	

A detailed statistical table giving the stocks on hand, the stocks in vessels on the ocean, and the amount unloading from the vessels at the different ports, is appended, which shows at a glance the condition of affairs abroad and the increase or decrease as compared with the corresponding period of 1886. The shipments represent the amount of oil going to the interior of Europe from the seaports:

STOCKS IN FOREIGN PORTS JUNE 52, 1887.

PORTS.	Stocks week ending June 25.		Stocks afloat week ending June 25.		Loading. Week ending June 25.		Grand total stocks afloat and loading.		Receipts From July 1.		Shipments from July 1.	
	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.
London.....	151,527	82,680	37,164	95,199	11,500	42,300	200, 91	220,179	718,635	612,312	670,341	718,592
Bremen.....	205,077	134,932	25,343	77,739	37,300	39,000	267,720	251,671	616,599	694,114	859,592	770,568
Hamburg.....	144,331	83,242	63,115	90,184	67,000	116,000	274,446	289,426	986,538	912,315	973,041	983,938
Antwerp.....	15,481	73,951	18,552	78,631	54,000	26,700	258,033	179,282	988,390	825,117	914,326	912,176
Rotterdam.....	83,768	37,473	30,543	83,217	28,800	34,500	143,111	155,190	460,160	520,427	445,319	564,895
Amsterdam.....	70,540	27,066		25,788	22,000		92,580	52,854	314,397	250,308	271,188	296,730
Stettin.....	9,871	31,231	33,076	61,522	56,500	26,400	99,447	119,153	259,220	348,983	307,761	333,645
Danzig.....	8,267	12,518	3,157	7,178			11,424	19,696	65,761	58,889	72,761	75,600
Total.....	707,375	400,413	173,786	424,259	265,600	242,600	1,146,761	1,067,272	3,641,065	3,610,153	3,843,988	3,931,552
Total stocks Continental Ports.....									1884.	1885.	1886.	1887.
Total afloat, ".....									1,250,372	884,055	707,375	400,413
Total loading, ".....									348,815	222,644	173,786	424,259
Total.....									165,600	202,600	265,600	242,600
Afloat and loading for direct Continental Ports.....									1,764,787	1,309,299	1,146,761	1,067,272
" " " Baltic Sea, exclusive Stettin and Danzig.....									36,500	14,300	8,200	
" " " ".....									88,100	90,900	8,700	68,000
" " " Total Continental Ports.....									1,889,387	1,414,499	1,163,661	1,135,272
" " " Total London.....									258,188	137,281	200,191	220,179
" " " English harbors, exclusive London.....									39,500	36,400	93,400	78,400
Grand total.....									2,187,075	1,588,180	1,457,252	1,433,851

OFFICIAL STATEMENT—EXPORTS OF PETROLEUM, MAY, 1887.

BY WM. F. SWITZLER, CHIEF OF BUREAU OF STATISTICS, WASHINGTON, D. C., JUNE 8, 1887.

CUSTOMS DISTRICTS.	MINER'L, CRUDE.		NAPHTHAS.		ILLUMINATING.		LUBRICATING & PARAFFINE OILS.		RESIDUUM.		TOTAL.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Boston and Charlestown, Mass.....					246,931	25,266	13,422	3,123			260,356	28,389
New York, N. Y.....	2,806,764	186,390	428,216	36,718	28,503,876	2,223,340	1,400,593	261,965	24,906	1,901	33,164,355	2,710,314
Philadelphia, Pa.....	4,725,002	291,734	298,988	21,863	11,584,406	838,593	15,937	2,163	383,082	17,916	17,007,415	1,172,269
Baltimore, Md.....					1,112,515	76,176	720	200			1,113,235	76,376
Total for May, 1887.....	7,531,766	478,124	727,204	58,581	41,447,731	3,163,375	1,430,672	267,451	407,988	19,817	51,545,361	3,987,348
Total for May, 1886.....	6,714,062	446,745	285,319	25,616	38,018,733	3,109,413	1,336,719	236,779	159,600	9,758	46,514,433	3,828,311
Total for 11 months ending May 31, 1887.....	71,885,094	4,597,449	14,078,205	1,230,893	417,360,931	32,344,746	15,634,965	2,870,156	3,244,744	156,211	522,203,939	41,199,455
Total for 11 months ending May 31, 1886.....	73,541,414	5,413,899	11,148,954	882,010	415,961,220	36,221,526	11,149,389	2,218,873	2,961,378	173,905	514,762,355	41,910,213

CRUDE QUOTATIONS FOR JUNE, 1887.

Day of Month and week.		BRADFORD.				OIL CITY.				NEW YORK.				PITTSBURGH.			
		Opened ...	Highest ...	Lowest ...	Closed ...	Opened ...	Highest ...	Lowest ...	Closed ...	Opened ...	Highest ...	Lowest ...	Closed ...	Opened ...	Highest ...	Lowest ...	Closed ...
W	1.....	63 $\frac{3}{8}$	63 $\frac{1}{2}$	62 $\frac{3}{8}$	62 $\frac{5}{8}$	63 $\frac{1}{2}$	63 $\frac{5}{8}$	62 $\frac{1}{2}$	62 $\frac{7}{8}$	63 $\frac{1}{4}$	63 $\frac{5}{8}$	62 $\frac{1}{2}$	62 $\frac{3}{4}$	63 $\frac{1}{4}$	63 $\frac{5}{8}$	62 $\frac{1}{2}$	62 $\frac{3}{4}$
T	2.....	62 $\frac{3}{4}$	62 $\frac{7}{8}$	62 $\frac{3}{8}$	62 $\frac{5}{8}$	62 $\frac{7}{8}$	63	62 $\frac{5}{8}$	62 $\frac{3}{4}$	62 $\frac{3}{4}$	63	62 $\frac{1}{2}$	62 $\frac{5}{8}$	62 $\frac{3}{4}$	62 $\frac{7}{8}$	62 $\frac{3}{8}$	62 $\frac{3}{4}$
F	3.....	62 $\frac{3}{4}$	63 $\frac{1}{4}$	62 $\frac{3}{4}$	63 $\frac{1}{8}$	62 $\frac{7}{8}$	63 $\frac{3}{8}$	62 $\frac{7}{8}$	63 $\frac{1}{8}$	62 $\frac{7}{8}$	63 $\frac{1}{4}$	62 $\frac{3}{4}$	63 $\frac{1}{8}$	62 $\frac{3}{4}$	63 $\frac{1}{4}$	62 $\frac{3}{4}$	62 $\frac{3}{4}$
S	4.....	63 $\frac{1}{8}$	63 $\frac{1}{2}$	63 $\frac{1}{8}$	63 $\frac{1}{8}$	63 $\frac{1}{4}$	63 $\frac{3}{4}$	63 $\frac{1}{8}$	63 $\frac{1}{8}$	63	63 $\frac{3}{8}$	63	63 $\frac{1}{8}$	63 $\frac{1}{4}$	63 $\frac{1}{8}$	63 $\frac{1}{8}$	63 $\frac{1}{4}$
M	6.....	63 $\frac{1}{8}$	63 $\frac{1}{4}$	62 $\frac{3}{8}$	62 $\frac{5}{8}$	63 $\frac{1}{4}$	63 $\frac{3}{8}$	62 $\frac{5}{8}$	62 $\frac{5}{8}$	63 $\frac{1}{4}$	63 $\frac{3}{8}$	62 $\frac{1}{2}$	62 $\frac{1}{2}$	63 $\frac{1}{8}$	63 $\frac{1}{4}$	62 $\frac{5}{8}$	62 $\frac{5}{8}$
T	7.....	62 $\frac{3}{4}$	62 $\frac{3}{4}$	62 $\frac{1}{4}$	62 $\frac{1}{4}$	62 $\frac{3}{8}$	62 $\frac{3}{4}$	62 $\frac{1}{4}$	62 $\frac{1}{4}$	62 $\frac{3}{8}$	62 $\frac{3}{8}$	62 $\frac{1}{8}$	62 $\frac{1}{4}$	62 $\frac{1}{4}$	62 $\frac{1}{4}$	62 $\frac{1}{4}$	62 $\frac{1}{4}$
W	8.....	62 $\frac{3}{4}$	63 $\frac{1}{8}$	62 $\frac{3}{4}$	62 $\frac{7}{8}$	62 $\frac{3}{8}$	63 $\frac{1}{8}$	62 $\frac{3}{8}$	62 $\frac{3}{4}$	62 $\frac{3}{8}$	63 $\frac{1}{4}$	62 $\frac{1}{8}$	62 $\frac{1}{4}$	62 $\frac{1}{4}$	62 $\frac{1}{4}$	62 $\frac{1}{4}$	62 $\frac{1}{4}$
T	9.....	63 $\frac{1}{4}$	63 $\frac{1}{2}$	63	63 $\frac{3}{4}$	63 $\frac{1}{8}$	63 $\frac{1}{2}$	63 $\frac{1}{8}$	63 $\frac{1}{8}$	63 $\frac{1}{8}$	63 $\frac{3}{8}$	63	63 $\frac{1}{8}$	63	63 $\frac{3}{8}$	63	62 $\frac{3}{4}$
F	10.....	63 $\frac{1}{4}$	63 $\frac{1}{4}$	62 $\frac{3}{4}$	63	63 $\frac{1}{8}$	63 $\frac{1}{4}$	62 $\frac{3}{4}$	63	63 $\frac{1}{8}$	63 $\frac{1}{4}$	62 $\frac{5}{8}$	63	63 $\frac{1}{8}$	63 $\frac{1}{4}$	62 $\frac{3}{4}$	63
S	11.....	63 $\frac{1}{8}$	63 $\frac{3}{4}$	63 $\frac{1}{8}$	63 $\frac{1}{4}$	63 $\frac{3}{8}$	63 $\frac{3}{4}$	63 $\frac{1}{8}$	63 $\frac{1}{8}$	63 $\frac{1}{8}$	63 $\frac{3}{4}$	63 $\frac{3}{8}$	63 $\frac{1}{2}$	63	63 $\frac{3}{8}$	63	63 $\frac{1}{2}$
M	13.....	63 $\frac{3}{4}$	64 $\frac{1}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{4}$	64 $\frac{1}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{8}$	63 $\frac{3}{4}$	64 $\frac{1}{8}$	63 $\frac{1}{4}$	63 $\frac{1}{4}$	63 $\frac{3}{8}$	64	63 $\frac{3}{8}$	63 $\frac{3}{8}$
T	14.....	63 $\frac{3}{4}$	63 $\frac{3}{8}$	62 $\frac{1}{2}$	63	63 $\frac{3}{4}$	63 $\frac{1}{2}$	62 $\frac{3}{8}$	62 $\frac{3}{4}$	63 $\frac{1}{2}$	63 $\frac{1}{2}$	62 $\frac{3}{8}$	62 $\frac{3}{4}$	63 $\frac{3}{8}$	63 $\frac{1}{8}$	62 $\frac{1}{2}$	62 $\frac{3}{8}$
W	15.....	63	63 $\frac{3}{8}$	62 $\frac{1}{4}$	62 $\frac{5}{8}$	62 $\frac{3}{4}$	63 $\frac{1}{4}$	62 $\frac{1}{4}$	62 $\frac{1}{4}$	63 $\frac{1}{2}$	63 $\frac{1}{2}$	62 $\frac{3}{8}$	62 $\frac{3}{4}$	63 $\frac{3}{8}$	63	62 $\frac{1}{2}$	62 $\frac{3}{8}$
T	16.....	62 $\frac{5}{8}$	63	62 $\frac{3}{4}$	62 $\frac{7}{8}$	62 $\frac{5}{8}$	63 $\frac{3}{8}$	62 $\frac{3}{4}$	62 $\frac{7}{8}$	62 $\frac{3}{4}$	63 $\frac{1}{4}$	62 $\frac{1}{2}$	62 $\frac{3}{4}$	62 $\frac{3}{8}$	63	62 $\frac{3}{4}$	62 $\frac{3}{4}$
F	17.....	63 $\frac{1}{4}$	62 $\frac{7}{8}$	62 $\frac{3}{4}$	62 $\frac{7}{8}$	63	63 $\frac{3}{8}$	62 $\frac{3}{4}$	62 $\frac{7}{8}$	62 $\frac{3}{4}$	63 $\frac{1}{4}$	62 $\frac{1}{2}$	62 $\frac{3}{4}$	62 $\frac{3}{8}$	63	62 $\frac{3}{4}$	62 $\frac{7}{8}$
S	18.....	62 $\frac{7}{8}$	63	62 $\frac{3}{4}$	62 $\frac{3}{4}$	63	63	62 $\frac{3}{4}$	62 $\frac{3}{4}$	63	63 $\frac{1}{8}$	62 $\frac{3}{4}$	62 $\frac{3}{4}$	62 $\frac{3}{8}$	63	62 $\frac{3}{4}$	63
M	20.....	62 $\frac{7}{8}$	63 $\frac{3}{8}$	62 $\frac{7}{8}$	63	62 $\frac{7}{8}$	63 $\frac{3}{8}$	62 $\frac{7}{8}$	63 $\frac{1}{8}$	62 $\frac{7}{8}$	63 $\frac{3}{8}$	62 $\frac{7}{8}$	63	63	63 $\frac{1}{4}$	62 $\frac{7}{8}$	63
T	21.....	63	63 $\frac{1}{8}$	62 $\frac{7}{8}$	63	63	63 $\frac{1}{4}$	62 $\frac{7}{8}$	63	62 $\frac{7}{8}$	63 $\frac{1}{4}$	62 $\frac{3}{4}$	62 $\frac{7}{8}$	63	63 $\frac{1}{4}$	62 $\frac{7}{8}$	63
W	22.....	62 $\frac{7}{8}$	63 $\frac{3}{8}$	62 $\frac{7}{8}$	63 $\frac{1}{8}$	63 $\frac{1}{8}$	63 $\frac{3}{8}$	62 $\frac{7}{8}$	63 $\frac{1}{8}$	62 $\frac{7}{8}$	63 $\frac{1}{4}$	62 $\frac{3}{4}$	63 $\frac{3}{8}$	63 $\frac{1}{8}$	63 $\frac{1}{4}$	62 $\frac{7}{8}$	63
T	23.....	63	63 $\frac{3}{8}$	62 $\frac{1}{2}$	62 $\frac{1}{2}$	63 $\frac{1}{8}$	63 $\frac{3}{8}$	62	62	63	63 $\frac{3}{8}$	62	62	63 $\frac{1}{8}$	63 $\frac{1}{4}$	62	63
F	24.....	62 $\frac{1}{8}$	62 $\frac{1}{2}$	60 $\frac{3}{4}$	61 $\frac{3}{8}$	62 $\frac{1}{2}$	62 $\frac{3}{8}$	60 $\frac{5}{8}$	61 $\frac{1}{4}$	61 $\frac{7}{8}$	62 $\frac{1}{8}$	60 $\frac{5}{8}$	61 $\frac{1}{4}$	62	62 $\frac{1}{4}$	60 $\frac{5}{8}$	62
S	25.....	61 $\frac{3}{8}$	61 $\frac{3}{8}$	61 $\frac{1}{4}$	61 $\frac{1}{2}$	61 $\frac{1}{2}$	61 $\frac{3}{4}$	61 $\frac{1}{4}$	61 $\frac{3}{4}$	61 $\frac{1}{4}$	61 $\frac{5}{8}$	61 $\frac{1}{8}$	61 $\frac{1}{8}$	61 $\frac{1}{4}$	61 $\frac{3}{8}$	61 $\frac{1}{4}$	61 $\frac{3}{8}$
M	27.....	61 $\frac{1}{2}$	61 $\frac{1}{2}$	61 $\frac{1}{8}$	61 $\frac{1}{8}$	61 $\frac{5}{8}$	61 $\frac{3}{8}$	61 $\frac{1}{8}$	61 $\frac{1}{8}$	61 $\frac{1}{2}$	61 $\frac{1}{2}$	61	61	61 $\frac{1}{2}$	61 $\frac{3}{4}$	61	61
T	28.....	61 $\frac{1}{8}$	62 $\frac{1}{4}$	60 $\frac{3}{4}$	62 $\frac{1}{4}$	61 $\frac{1}{4}$	62 $\frac{1}{8}$	60 $\frac{3}{4}$	62	61 $\frac{1}{2}$	62 $\frac{1}{8}$	60 $\frac{1}{2}$	61 $\frac{7}{8}$	61	62 $\frac{1}{8}$	60 $\frac{3}{4}$	62
W	29.....	62	62 $\frac{1}{4}$	61 $\frac{3}{8}$	61 $\frac{3}{4}$	62	62 $\frac{1}{4}$	61 $\frac{5}{8}$	61 $\frac{3}{4}$	62 $\frac{1}{2}$	62 $\frac{1}{8}$	61 $\frac{1}{2}$	61 $\frac{3}{4}$	62	62 $\frac{1}{4}$	61 $\frac{1}{2}$	61 $\frac{7}{8}$
T	30.....	61 $\frac{5}{8}$	61 $\frac{3}{4}$	61 $\frac{3}{8}$	61 $\frac{3}{8}$	61 $\frac{5}{8}$	61 $\frac{3}{4}$	61 $\frac{3}{4}$	61 $\frac{3}{4}$	61 $\frac{7}{8}$	61 $\frac{7}{8}$	61 $\frac{1}{2}$	61 $\frac{3}{8}$	61 $\frac{3}{4}$	61 $\frac{3}{4}$	61 $\frac{3}{4}$	61 $\frac{3}{4}$

JUNE OPERATIONS.

THE ENTIRE REGION—WELLS COMPLETED, WELLS DRILLING, AND RIGS UP AND BUILDING.

WELLS COMPLETED IN JUNE, 1887.

Alleghany Field.

Twp.	Owner.	Barrels.
Scio, 46,	L G Norton No 3.....	5
Wirt, 47,	McQueen & Johnston No 2.....	6
" 48,	Tew & Thurston No 2.....	5
" 53,	(Van Velsor) P M Shanton & Co.....	8
Clarksville, 3,	(Jordan) Angell Oil Co.....	4
" 6,	(Hamilton) Ackerly, Barton & Co No 23.....	5
" 12,	National Transit Co No 86 gas	
Wells completed.....		7
Production.....		33
Dry.....		1

Bradford Field.

East and West Branches.

2268,	R. J. Straight.....	8
King, Wood & Young No 2.....		8
Drake, J. T. Jones, No 27.....		8
Bingham, Van Vleck & Mitchell No 43..		10
Hooker, P Hooker & Son.....		4
Quintuple, 20,	Carroll & Peiffer.....	5

Kendall Creek.

Melvyn, P C L & P Co No 96.....	6
" " " No 97.....	6
" " " No 98.....	8
" " " No 99.....	8
" " " No 100.....	8

Knapp's Creek.

Duke, J West No 8.....	6
Erskine, Doe & Smith No 2.....	4

Foster Brook.

C B & H, Watson Oil Co No 50.....	8
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Indian Creek.

W & M, McKinney Bros No 8.....	8
Gale, G N Moore No 13.....	8
" Barden, Cook & Dodd No 2.....	6

Cole Creek.

Bingham, lot 584, Associated Producers No 67.....	15
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Kinzua.

Guffy & Hulings, Union Oil Co No 72....	25
Wood's lease, Stewart & Co No 4.....	6
Lot 128, P T & W C Kennedy No 5.....	12
" 128, " " No 3.....	8
<hr/>	
Wells completed.....	22
Production.....	180
Dry.....	0

Warren and Forest.

GLADE AND OTHER TOWNS.

Kinzua Village.

Weed, J R Morse No 10.....	50
Hodge, " No 3.....	6
" " No 4.....	10
Willie Run, Smith, Bright & Co No 10(est)	150
5555, Phillips & Morse.....	dry
Johnson, Sill & Odell No 3.....	450
" " " No 4.....	150
2921, (Mead twp) After Eight Oil Co (Sill & Odell)....	gas
Dew Drop, Porter & Co No 3.....	5
Wardwell, Benedict & Rockwell.....	8
Rollins, McCalmont & Morse No 4.....	3
English, Ben Brown.....	dry
<hr/>	
Wells completed.....	12
Production	832
Dry.....	3

Clarendon.

35, (McKeown) Hazeltine & Bell.....	5
35, Henderson & Murphy No 12.....	5
35, (Willie) D McKelvy & Co No 4.....	6
464, Columbia Oil Co No 25.....	5
497, D. Riddlesperger.....	5
497, ".....	5
104, O'Donnell & Hill No 5.....	5
105, Hackett & Shirley No 8.....	5
107, W B Roberts & Son.....	5
162, J A Dower.....	4
532, C A & D Cornen No 2.....	5
557, Dice & Lowden.....	5

Wells completed.....	12
Production.....	60
Dry.....	0

Tiona.

82, (lot 20) J L McKinney & Co.....	8
82, (lot 8) ".....	6
75, ".....	5
110, " No 9.....	5
110, " No 10.....	5
159, " No 9.....	5
281, Horton, Crary & Co.....	8

Wells completed.....	7
Production.....	42
Dry.....	0

Balltown.

2514, J C Walsh.....	10
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Wells completed.....	1
Production.....	10
Dry.....	0

Kane.

3775, (sub 14) J Stettheimer No 8.....	10
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Wells completed.....	1
Production.....	10
Dry.....	0

Grand Valley.

Blakeslee, Miller & Crippens No 12.....	8
" " " No 13.....	10
" " " No 14.....	10
Hunter, National Oil Co No 10.....	6
Gibbs, L B Wood & Co No 5.....	5
" " " No 6.....	5
" " " No 7.....	5
" " " No 8.....	5
" " " No 9.....	5
Knapp, " " No 3.....	5
" " " No 4.....	5
Huidekoper, " " No 4.....	2
Moore, " " No 1.....	dry
Fisher, " " No 8.....	5
Anderson, Brown Bros.....	1
Lot 150, Fertig & Bartlett No 8.....	5
Proper, Boyce & Duck No 3.....	8
Lot 150, Nelson Far ell No 13.....	7
Lot 135, (B & R tract) Emery & Co.....	5
Lot 149, G P Kepler & Co No 17.....	10
Lot 149 " " No 18.....	10
Breen, John Breen.....	10
Phila lands, Stewart & Lee.....	dry
Newton, Reno Oil Co.....	dry
Enterprise, (Dibble) Dibble Bros.....	3
Spring Creek (Shaw) Stewart & Co.....	dry

Wells completed.....	27
Production.....	137
Dry.....	4

Miscellaneous—Elk County, Etc.

2020, Clark, Foster & Andrews No 1.....	12
2033, Clark & Foster No 4.....	10
2033, " " No 5.....	10
2033, " " No 6.....	15
2033, Highland Oil Co No 2.....	15
2033, Porter, Thyng & Co No 5.....	10
2027, Taylor, Torrey & Co No 1.....	10
Dawson, (Stewart's Run) Taylor, Torrey & Co.....	dry
Joslyn, (Harmony twp) Wood & Co.....	dry

Wells completed.....	9
Production.....	82
Dry.....	2

Lower Country.

Venango and Other Sections.

Farm.	Operator.	Barrels.
Kaufman, A P Dale No 10.....		8
Bully Hill, (Miller) Smith & Galbraith		
" " " No 3.....		4
Mt Hope, (J Shirk) Dr Galbraith No 4....		10
Columbia, Columbia Oil Co No 174.....		10
Blood, P Bankson.....		dry
Curtis, Thos Smith.....		dry
Kernan, Kirkwood & Bancroft.....		10
Acams, Glenn & Allen.....		6
Perrine, J J Doyle.....		3
Slab Furnace, Pittsburgh Oil Co.....		8
Pln Oak, J B Smithman.....		6

Haliday Run, B F Brundred.....	5
Raymond, Raymond.....	3

Vicinity Pleasantville.

At Kinson, (Shamburg) W P Black No 2..	10
Talman, " " No 1.....	10
Fleming, " " No 2.....	15
Fisher, " Young & Locke No 3.....	10
Sheridan, " Doolittle & Haskell No 1....	2

Tipperary, Hall's Run, Etc.

Heckathorn, Phinney & Bishop.....	8
C Rumbold, J V Ritts No 2.....	dry
Plummer, Samuel Plummer.....	6
Hitchcock, Steele & Mitchell.....	4

Tarkill.

Webb, Taylor, Torrey & Murphy.....	10
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Rockland or Red Valley.

W Shafer, Dale Bros.....	dry
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Vicinity Emlenton.

Hays, James Bennett.....	8
Byrom Centre, (Robinson) Middleton & Co.....	6
" R Sloan, Duncan & Co.....	dry
W P Grant, Edwards & Co.....	dry

Smoky District.

S Micklin, Melton & Shaffer.....	6
Bolinger, Heasley & Co.....	dry
Biglow, Shirk & Co.....	5
Malett, Duffield & Co.....	5

Wells completed.....	32
Production.....	173
Dry.....	7

Clarion.

Widiken, Berlin & Sons.....	5
J H Frampton, Monroe Oil Co.....	2
Strattonville, Keatley & Co.....	dry

Wells completed.....	3
Production.....	7
Dry.....	1

Butler and Armstrong.

Gelbech, T W Phillips & D Oshorne No 4	480
Dunbar, " " No 2 dry	
Stewart, " " No 1 dry	
" " " No 2 dry	
" " " No 3 420	
Behm, " " No 1 1200	
" " " No 1 dry	
" " " No 2 50	
" " " No 3 dry	
" " " No 4 dry	
" " " No 5 400	
John Ehrman, " " No 1 dry	
Barto, " " No 1 dry	
Emrick, " " No 1 dry	
Blakeley, Leidecker Bro No 6.....	100
" Johnson & Root No 2.....	240
Reinbold Station, Painter Bros & Fisher Oil Co.....	dry
Dunbar, Reep, Westerman & Co.....	dry
Story, Hazlewood Oil Co No 9.....	5
Rev Hickey, Brushwood Oil Co No 5....	25
Chas Duffey, M Finnegan No 6.....	20
Saxon, Brown, Hovls & Co.....	dry
Boyd, Shenango Gas Co (for gas).....	dry
Henry, " " ".....	dry
Widow Riley, McCullough & Co.....	6
Saxonburg, Boyce & Co (for gas).....	gas
Thompson, Moonson & Albert.....	dry
Barnhart, Vensel, Larkin & Co No 5....	20
Houghton, Brady & Co No 2.....	15
Shultz, Frazier Bros.....	10
" Boyle.....	15
Valencia, Munhall & Co.....	dry

Martinsburg.

Knox, Hoffman & Co.....	3
Knox, Jordan & Co No 2.....	15
G Shakeley, M P Black.....	dry
Story, Kelley & Co.....	dry

Thorn Creek.

Dixon, Christie & Co.....	7
Cooper, Thayer & Crosby & Anchor Oil Co.....	5
Burton, Farmers Oil Co.....	5
Bulford, Klingensmith.....	20

Wells completed.....	86
Production.....	1861
Dry.....	15

Washington.

Martin heirs, John McKeown No 4.....	2500
Cameron, Willets, Young & Chartiers Oil Co.....	10
Baker, Dyer & W B Roberts.....	dry
Workman, Union Oil Co No 3 (est).....	20
Gordon, P L & H Co No 7.....	65
Welsh, Welsh Oil Co.....	40
Whittlesee, Caldwell & Co No 2.....	85

Cooper District.

407, Shank & Stewart No 9 (old)....	rig
407, " " No 13 (old)....	rig
Syndicate, Anchor Oil Co, No. 19....	sand
New rigs.....	0
Old rigs.....	2
Drilling.....	1
Total.....	3

Balltown.

3194, Poreupine Oil Co No 39 (old)....	rig
3195, (Crisman) N F Clark No 14 (old)....	rig
3195, Proper Reserve Oil Co.....	drilling
(Green) J C Welsh.....	rig bldg
Near Marienville, Cappean & Artes.....	drilling
New rigs.....	1
Old rigs.....	2
Drilling.....	2
Total.....	5

Kane.

343, (Looker) Ernhout & Co No 3....	drilling
344, Treat & Mallory No 8 (old)....	rig
420, Coast & Sons No 24 (old)....	rig
3767, Union Oil Co (old)....	rig
New rigs.....	0
Old rigs.....	3
Drilling.....	1
Total.....	4

Grand Valley.

Phil lands, Crippens & Phillips No 6 (old)....	rig
Campbell, National Oil Co No 18 (old)....	rig
" " " No 19 (old)....	rig
Hunter, " " No 11....	rig
" " " No 12....	rig
" " " No 13....	rig
Gibbs, L B Wood & Co No 10....	drilling
Lot 150, Nelson Farrell No 14....	rig
" 150, " " No 15....	rig
" 137, G P Kepler & Co (old)....	rig
" 149, " " No 19....	sand
" 138, " " 2....	rig bldg
" 136, " " 3....	rig
Lot 150, Fertig & Bartlett No 9....	drilling
" 135, (B & R tract) D Emery & Co	rig
" 238, J B Jennings & Grandin (old)....	rig
Proper, Bovee & Duck No 4....	drilling
New rigs.....	8
Old rigs.....	5
Drilling.....	4
Total.....	17

Miscellaneous—Elk County, Etc.

1799, sub 2, Gillis Farm Oil Co., No 1	300
2033, Porter, Thyng & Co No 7....	drilling
2032, Boggs, Rosenberg & Co No 3 (fishing)....	sand
2032, " " No 4....	rig
2027, Armstrong & Boggs, No 1....	rig
2676, (McKean) Wilcox Tannery Co.	drilling
Rolfe, " " "....	drilling
2033, Clark & Foster No 7....	drilling
2025, " " No 1....	rig
3664, " " No 5....	rig
2033, Highland Oil Co No 3....	rig
Millstone twp, Welsh & Wallace....	rig
New rigs.....	6
Old rigs.....	0
Drilling.....	6
Total.....	12

Lower Country.*Venango and Other Sections.*

Allegheny Bank lands, Oil City Fuel Supply Co (old)....	rig
McBride, Thomas Smith (old)....	rig
Osmer, Galbraith & Parker (old)....	rig
Slab Furnace, S P McCalmont (old)....	rig
Rynd, Wratten & Co (old)....	rig
Columbia, Columbia Oil Co No 175.	drilling
Tract 47, J J Fisher No 10 (old)....	rig
Niagara, H Wilbur.....	rig
Pioneer, (Keech) J Stillwagon (old)....	rig
" (McElheney) Pres McCray	drilling
Pithole, (Blank) Duke & Applebee (old)....	rig
Raymond, J J Doyle.....	drilling
Henderson, A T Kreps & Co.....	drilling
Adams, Glenn & Allen.....	drilling

Vicinity Pleasantville.

Landas, W P Black (old)....	rig
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Dailey, (Shamburg) W P Black	rig
Talman, " " No 2....	drilling
" " " No 3....	drilling
" " " "....	rig
Tarr, " " "....	rig bldg
Atkinson, (Shamburg) Wait & Hammond....	rig
" " " "....	rig bldg
Fisher, " " Seep & Co....	rig bldg
Ankerharser, " " Wilson Bros....	rig bldg
Poor, Joy & Co.....	rig
Fisher, Palmer & Co.....	rig
Sheppard, J Sheppard (old)....	rig

Tipperary, Hall's Run, Etc.

Moore, Beers & Co No 3 (shut down)	750
" Speechley & Co No 2 (old)....	rig
Burns, Deitrich & Warfield No 3....	fishing
Brough, Dufur & Co (old)....	rig
J R Grant, Kelley & Smullin....	drilling
Grant, Heasley & Grant.....	drilling

Rockland or Red Valley.

Niekleville, (Persing) Myers Bros....	drilling
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Vicinity Emlenton.

J W Smith, Riverside Oil Co No 8....	drilling
Flynn, (Byrom) Flynn & Brown....	200

Smoky District.

P Stroup, Heasley & Co.....	rig
John Pinley, ".....	rig
Malett, Lee & Co (fishing)....	200
Dale, P M Dale.....	drilling

Bullion.

Hovis, Hovis (old).....	rig
Crawford, Hoffman & Co.....	500
New rigs.....	13
Old rigs and shut down.....	14
Drilling.....	15
Total.....	42

Clarion.

Black, Berlin & Sons.....	rig
Berlin, Berlin & Sons (old)....	rig
John Henel, Koch Oil Co No 8 (old)	rig
Lloyd, Dr Metzger (old)....	rig
Shreffler, McCallom & Co (old)....	rig
Wagner & Curl, J V Ritts (old)....	rig
Brown, J V Ritts (old)....	rig
Heasley, Heasley & Co (old)....	rig
Montgomery, Montgomery....	300
Wagner, Hahn & Wagner....	500
Shippen, John J Carter.....	drilling
Cotterman, Weaver & Co.....	800
Egypt, Hess & Hackett No 1....	rig
Deloe, Kribbs & Co.....	rig bldg
West Freedom, Kerr, McGraw & Co	100
Near Foxburg, Simpson, Kerr & Co	drilling
New rigs.....	3
Old rigs.....	7
Wells drilling.....	6
Total.....	16

Butler and Armstrong.

F Miller, W G Crawford & Co (old)....	rig
Chas Duffey, Hoch & Co (old)....	rig
Washington twp, Armstrong & Co.	1400
Gelbeck, T W Phillips & D Osborne	sand
" " " No 5....	drilling
" " " No 6....	drilling
Dunbar, " " "....	1300
Stewart, " " "....	1300
" " " "....	300
" " " "....	300
Behm, " " "....	1400
Dickey, " " "....	1300
Z Markle, " " "....	1380
Stalun, " " "....	300
" " " "....	800
Helm, " " "....	1400
Peiffer, Marshall Oil Co (fishing)....	1400
Blakeley, Leidecker Bros No 6 (fishing)....	1450
" Johnson & Root No 3....	sand
Behm, Burchfield & Co No 3....	sand
Duncan, McKelvey & Co No 1....	1700
Walley, Walley & Jordan.....	rig
Peiffer, McManany, Greenlee & Co	1300
" " " No 1 (seut down)....	sand
" " " No 2....	sand
Dunbar, Root, Johnson & Co (shut down)....	200
Rev Hickey, Brushwood Oil Co No 7	200
McClymons, Standard Plate Glass Co (gas)....	1300
McCue, Brady & Simpson.....	drilling
Coyle, Fisher Oil Co No 2....	1400
St Joe, Boyle.....	drilling
Ball, P C L & P Co.....	sand
Saxonsburg, Kiskadden & Co....	1400
" Iman, McBride & Co....	500
Frederick, Brady & Simpson No 3....	500

Jos Maharg, Hunter & Co.....	800
Kepples Corners, Mortimer & Co....	sand
Black, Garret & Gray.....	drilling
Jacob Frederick, Shenango Gas Co.	drilling
Hewins, " " "....	drilling
Herman Station, Nat Transit Co....	drilling
Lenox, Greenley & Co.....	rig bldg
Graff, Queen & Guffey.....	drilling
Craigtown, Guffey & Co (for gas)....	drilling
Frazier's Mills, Yeagle & Co.....	rig bldg
Wexford, Shetler & McKelvey....	drilling
Church lot, Quilter & Co.....	drilling

Martinsburg.

Shakely, Asa Byers.....	500
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Thorn Creek.

Harbison, Connors & Fishel (old)....	rig
Bulford, Iman, Waldron & Co.....	1100
Burton, Collins & Co No 2....	1100
McLaughlin, Thorn Oil Co.....	200
Dixon, Weible Bros & Ferguson....	1500
Andrews, Muller, Kimmel & Co....	600
New rigs.....	5
Old rigs and shut down.....	8
Drilling.....	38
Total.....	51

Washington.

I Wilson, Forest Oil Co (old)....	rig
Johnson, " " (old)....	rig
Martin heirs, John McKeown No 6.	100
Cameron, Willets, Young & Chartiers	2000
" " " No 10....	576
" " " No 11....	1750
Munce, Willets & Son No 20....	800
" " " No 23....	1300
" " " No 24....	1400
Martin, Wheeling Oil Co No 4....	1500
Coal Center, Hornbake.....	1800
Wiles, C O & G Co No 1....	2250
" " " No 2....	drilling
McKeesport, Stone & Co.....	rig
Wright, Chartiers Oil Co & F W Andrews (old)....	300
Bane, Ten-Mile Oil Co.....	1740
Fergus, Chartiers Oil Co No 3....	900
" " " No 4....	1000
Weaver, C O & Gas Co No 3....	1100
Davis, Union Oil Co No 6....	2200
Wade, B B Campbell & Co No 4....	1850
" " " No 5....	rig
California, J M Guffey (for gas)....	drilling
Carson, Schmertz & Co (for gas)....	drilling

Taylorstown.

Blayne, Hart Bros No 3.....	1600
Carrothers, West Virginia Natural Gas Co (fishing)....	1500
R Cundall, Anchor Oil Co No 2....	1300
Flack, West Virginia Nat Gas Co....	2300
Hodgens, " " "....	400
Noble, " " " No 2....	800
J Hutchison, " " "....	rig bldg
Dinsmore, " " (for gas)....	rig bldg
Robert Noble, " " "....	rig
Buchanan, R H Thayer.....	150
W B Carrothers, Hart Bros & Co....	350
Carrothers, Caldwell & Co.....	100
New rigs.....	2
Old rigs.....	3
Drilling.....	25
Total.....	30

Shannopin.

Thos Pinkerton, J S McKelvy (old)	rig
Charles Eachel, Raccoon Oil Co No 4 (old)....	rig
Riddle, Philadelphia Co (fishing)....	1000
John Morrow, Raccoon Oil Co No 4 (old)....	rig
McCoy, Reed, Davidson & Co.....	500

Greene County, Etc.

Fordyce, E M Hukill & Co No 1 (shut down)....	1360
Girard, E M Hukill & Co No 1....	1060
Girard, E M Hukill & Co No 2....	drilling
Hathaway, E M Hukill & Co No 1 (fishing)....	1060
Mt. Morris, E M Hukill & Co No 1 (old)....	drilling
Longanecker, " " "....	rig
Ninevah, Johnston & Hamilton....	drilling
McGinnis farm, Wheeling Natural Gas Co (shut down)....	1100
Sugar Grove, Wheeling Natural Gas Co (shut down)....	1200
Moundsville, J W Craig & Co....	drilling
Bristoria, Forest Oil Co.....	1300
Biddle, E M Hukill & Co.....	drilling
New rigs.....	0
Old rigs and shut down.....	4
Drilling.....	6
Total.....	19

Runs, Shipments and Stocks.

RUNS OR RECEIPTS.

PIPE LINE.	JUNE, 1887.	MAY, 1887.
National Transit Co.....	1,314,078.29	1,376,834.96
Tidewater.....	176,089.25	183,207.88
Octave Oil Co.....	2,469.28	2,342.00
Keystone Pipe Line.....	35,350.72	28,485.29
Pittsburgh Pipe Line.....	111,273.14	111,393.61
Southwest Pennsylvania.....	263,134.15	297,919.38

Total.....	1,902,399.83	2,000,183.12
Daily average.....	63,413.38	64,522.04

In the above runs only the oil received by the National Transit Co. directly from the wells, is included.

DELIVERIES OR SHIPMENTS.

PIPE LINE.	JUNE, 1887.	MAY, 1887.
National Transit Co.....	1,760,679.00	1,880,588.58
Tidewater.....	217,690.05	222,821.19
Octave Oil Co.....	2,593.23	3,270.00
Keystone Pipe Line.....	25,724.39	24,006.36
Pittsburgh Pipe Line.....	112,007.21	111,383.25
Southwest Pennsylvania.....	305,890.96	305,970.13

Total.....	2,424,584.84	2,548,039.51
Less oil transferred between lines.....	374,706.86	90,613.17

Total.....	2,049,877.98	2,157,426.34
Daily average shipments.....	68,329.26	69,594.40

In the above shipments only the oil delivered to refiners is included.

Daily excess of shipments over runs, June.....	4,915.93
Daily excess of shipments over runs, May.....	5,072.36
Daily excess of runs over shipments, April.....	4,083.45
Daily excess of shipments over runs, March.....	7,983.78
Daily excess of shipments over runs, February.....	3,564.10
Daily excess of shipments over runs, January, 1887.....	8,702.88
Daily excess of shipments over runs, December.....	11,270.81
Daily excess of shipments over runs, November.....	10,818.51
Daily excess of shipments over runs, October.....	580.75
Daily excess of runs over shipments, September.....	8,057.13
Daily excess of runs over shipments, August.....	11,931.56
Daily excess of runs over shipments, July.....	5,557.20
Daily excess of runs over shipments, June.....	4,793.41
Daily excess of runs over shipments, May.....	3,967.06
Daily excess of shipments over runs, April.....	4,899.20
Daily excess of shipments over runs, March.....	4,561.80
Daily excess of runs over shipments, February.....	14,701.52
Daily excess of shipments over runs, January, 1886.....	7,825.68

NET STOCKS.

PIPE LINE.	JUNE 30, 1887.	MAY 31, 1887.
National Transit Co.....	28,731,647.70	28,816,105.22
Tidewater.....	1,561,836.52	1,576,978.78
Octave Oil Co.....	3,235.13	3,788.00
Keystone Pipe Line.....	36,771.88	37,145.05
Pittsburgh Pipe Line.....	3,741.93	4,471.00
Southwest Pennsylvania.....	1,122,231.67	1,164,988.48

Total.....	31,459,464.33	31,633,476.53
Stocks decreased June.....		174,012.20
Stocks decreased May.....		286,403.15
Stocks increased April.....		112,893.77
Stocks decreased March.....		257,699.31
Stocks decreased February.....		105,988.75
Stocks decreased January, 1887.....		777,975.85
Stocks decreased December.....		357,196.56
Stocks decreased November.....		286,526.86
Stocks decreased October.....		1,790.72
Stocks increased September.....		214,073.99
Stocks increased August.....		362,652.56
Stocks increased July.....		188,510.62
Stocks increased June.....		216,583.97
Stocks increased May.....		110,800.44
Stocks decreased April 1886.....		165,635.61

	RECEIPTS.	DELIVERIES.
Daily average June.....	63,413	68,329
Daily average May.....	64,522	69,594
Daily average April.....	65,072	66,988
Daily average March.....	63,915	71,899
Daily average February.....	63,374	66,938
Daily average January, 1887.....	62,629	71,332
Daily average December.....	67,857	79,127
Daily average November.....	70,767	81,586
Daily average October.....	76,019	76,600
Daily average September.....	77,989	69,932
Daily average August.....	76,880	64,949
Daily average July.....	74,880	69,323
Daily average June.....	75,811	71,017
Daily average May.....	68,602	64,635
Daily average April 1886.....	64,228	69,127

NOTE—The above figures are in barrels of 42 gallons each, and include only the pipe lines of the New York and Pennsylvania oil regions. In addition to the above receipts from 1200 to 1600 barrels of oil a day are shipped by rail out of the region by large producing firms which have no chartered pipe line.

SHENANGO & ALLEGHENY R. R.

TAKES EFFECT MONDAY, JULY 11, 1887.

Trains are run by Standard Central Time (90th Meridian.)

NORTHWARD.			STATIONS.	SOUTHWARD.		
6	4	2		1	3	5
P. M.	A. M.	A. M.		A. M.	A. M.	P. M.
6 35	11 55	8 20	Ar.....Greenville.....	6 50	11 10	3 50
6 25	11 45	8 10	.....Shenango.....	7 00	11 20	4 00
6 13	11 32	7 58	.....Kremis.....	7 11	11 32	4 11
6 04	11 23	7 50	.....Fredonia.....	7 20	11 42	4 20
5 58	11 18	7 45	.....Coolspring.....	7 24	11 46	4 25
5 57	11 16	7 44	.....Kerby Siding.....	7 25	11 47	4 26
5 47	11 05	7 35	.....Mercer.....	7 35	11 57	4 37
5 37	10 55	7 25	.....Pardee.....	7 45	12 07	4 46
5 33	10 51	7 20	.....Filer.....	7 49	12 11	4 50
5 26	10 44	7 12	.....Grove City.....	7 58	12 18	4 58
5 23	10 41	7 09	.....Reed.....	8 00	12 20	5 00
5 13	10 30	6 59	.....Harrisville.....	8 11	12 31	5 13
5 08	10 26	6 54	.....Wick.....	8 15	12 35	5 17
5 03	10 21	6 49	.....Branchton.....	8 20	12 40	5 22
5 00	10 18	6 45	.....Coaltown Junction.....	8 21	12 41	5 23
4 57	10 16	6 42	.....Keisters.....	8 24	12 44	5 26
4 53	10 12	6 39	.....Slippery Rock Park.....	8 29	12 47	5 29
4 50	10 09	6 36	.....Hallston.....	8 32	12 50	5 32
4 42	10 01	6 28	.....Enclid.....	8 42	1 00	5 42
4 33	9 52	6 18	.....Jamisonville.....	8 51	1 10	5 52
4 25	9 45	6 10	.....Onida.....	8 59	1 18	6 00
4 15	9 35	6 00	.....P. & W. Junction.....	9 10	1 30	6 10
4 05	9 30	5 55	Dp.....Butler.....	9 13	1 35	6 15
			Pittsburgh & Western R. R.			
12 40	7 20		.....Allegheny.....	11 20	4 00	8 00
P. M.	A. M.	A. M.		A. M.	P. M.	P. M.

HILLIARD BRANCH.

34		32		STATIONS.	33		35	
A. M.	A. M.	A. M.	A. M.		A. M.	P. M.	A. M.	P. M.
12 00	6 40	Ar.....	Branchton.....	Dp.....	8 45	5 30		
11 50	6 35	.....	Bovard.....		8 55	5 35		
11 30	6 15	.....	Annandale.....		9 15	6 00		
11 20	6 07	.....	Roy.....		9 25	6 10		
11 00	6 00	Dp.....	Hilliard.....	Ar.....	9 35	6 20		
A. M.	A. M.				A. M.	P. M.		

Trains 4 and 5 run daily with through coach service between Allegheny, Chautauqua Lake and Jamestown, N. Y. All other trains daily except Sunday.

L. D. STINSON, G. P. A.,
Greenville, Pa.

J. T. BLAIR, Gen. Man.,
Greenville, Pa.

Pat. July 6, '86. MILLER AUTOMATIC PACKER Pat. July 27, '87.



PACK GUARANTEED.

FOR OIL AND GAS WELLS.

EASILY DRAWN OUT

Supports the Casing and Packs at any Point in the Well.

JUST THE PACKER FOR WELLS HAVING LEAKY CASING. Packers for 6 in. and 5½ in. wells have 4¼ in. inside diameter to drill or pump through. Also reduced to any size tubing for flowing wells or small gas wells. Write for Circular.

Telephone 523.

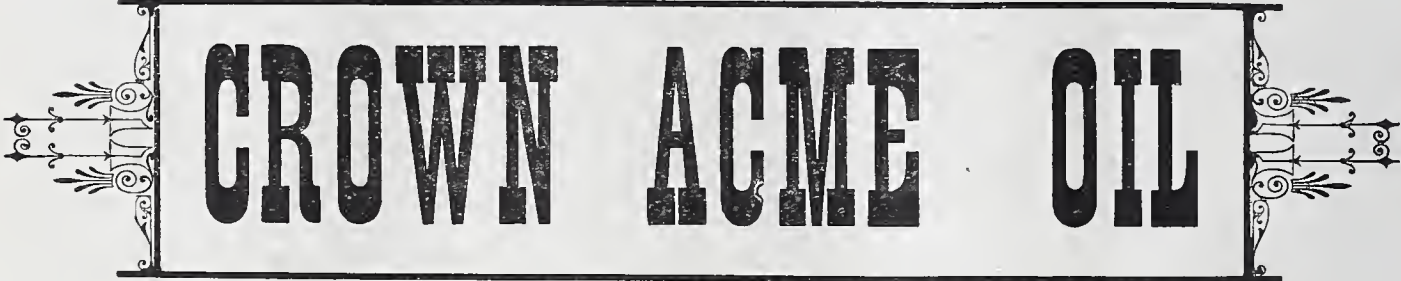
MILLER & McCONNELL, 144 Fifth Av., Pittsburgh, Pa.

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MANUFACTURERS OF THE

**CROWN ACME OIL**

Prepared with Great Care for Family Use.

ABSOLUTELY SAFE,

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Best Illuminator in the World,

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BOVAIRD & SEYFANG,

The Leading Drilling Tool Manufacturers,

—AND DEALERS IN—

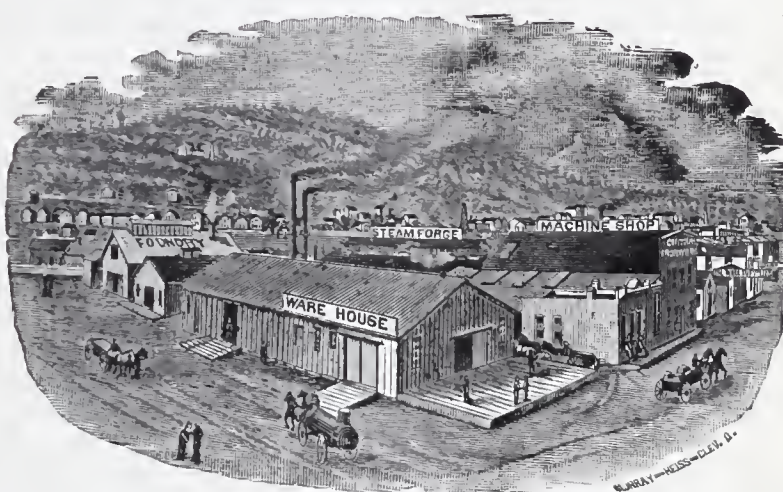
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All Our Second-Hand Machinery Offered at Exceedingly Low Prices,
Thoroughly Rebuilt and
Guaranteed.

✉ Correspondence Solicited.

BOVAIRD & SEYFANG,
Davis Street, BRADFORD, PA.



Bradford National Bank

—OF—

BRADFORD, PENN'A.

Capital, \$200,000. Surplus, \$40,000.

O. F. SCHONBLOM, Pres't. P. T. KENNEDY, Vice-Pres't.
T. H. TOMLINSON, Cashier. C. A. MITCHELL, Asst. Cashier

DIRECTORS:

P. T. Kennedy, W. C. Kennedy, R. J. Straight
O. F. Schonblom, H. F. Whiting.

TRANSACT A GENERAL BANKING BUSINESS.

Make collections; sell drafts on Europe; buy and sell United States bonds.

✉ Prompt attention given to all business entrusted to us at the Lowest Rate of Charges.

JOHN CONLEY,

MANUFACTURER OF

IRON, GAS AND STORAGE TANKS,

—AND—

GASOMETERS.

REPAIRING PROMPTLY ATTENDED TO

SHOP, NO. 17 GORTON STREET,
BRADFORD, PA.

First National Bank

—OF—

BRADFORD, PA.

Capital, \$150,000. Surplus, \$30,000.

J. M. FULLER, Pres't, F. W. DAVIS, Vice-Pres't.
W. W. BELL, Cashier.

DIRECTORS:

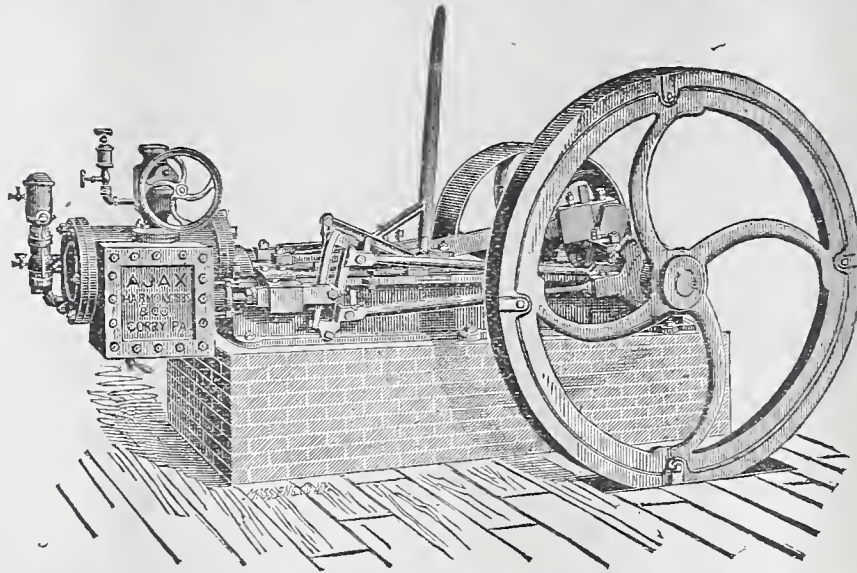
S. G. BAYNE, D. O'DAY, JOSEPH SEEP, T. WISTAR
BROWN, Vice-President Provident Life Trust Co.,
Philadelphia; A. B. WALKER; F. W. DAVIS; C.
C. MELVIN; J. M. FULLER; W. W. BELL.

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Transact general banking business. Make collections, sell drafts on Europe, and give prompt attention to all business entrusted to us at lowest rates.

THE AJAX ENGINE,



Manufactured by Harmon, Gibbs & Co.,

Is still the favorite in every field from the 400 feet wells of Grand Valley to the 3,000 feet well of Washington. Economy in Fuel, Strength, Power, Speed and Durability are its strong points. Nearly 2,000 now in use, and you may travel from Wellsville, N. Y., to Macksburg, O., and not find one in a junk or repair shop.

We finish them in the shop and do not have to follow them into the field to make them run. Record of "Ajax" No. 1105 over 22,000 feet and still drilling.

JAMES M. LAMBING, General Agent, Corry, Pa.

OFFICE OPPOSITE PASSENGER DEPOT.

VICK'S
FLORAL GUIDE.

If you are in want of Garden, send 10 cts. or anything for the SEEDS for above, which can be deducted from the first order.
JAMES VICK, SEEDSMAN, ROCHESTER, N. Y.

Buffalo, Rochester & Pittsburgh R. R.

BUFFALO AND ROCHESTER DIVISION.

May 22, 1887.

Eastern Time.

STATIONS.							
P. M.	A. M.	P. M.	A. M.	Ar.	Lv.	P. M.	A. M.
6 20	11 00	Ar.	Buffalo..	Lv.	8 10	5 10	
7 15			" Rochester "			7 50	
8 16			" Salamanca "			11 44	
2 30	3 30	8 00	Lv.	Bradford.	Ar.	11 00	8 00
6 00						12 30	
	2 15		Ar	do	Lv.	12 55	
	11 38		" Ridgway "			3 26	
	10 14		" Falls Creek "			4 51	
	10 08		" Dubois "			4 52	
	9 00		Punxsutawney.			5 59	
	A. M.		Lv	Ar			

Thousand Mile Tickets sold at Two Cents per mile.

Connections made at Salamanca with the N. Y., P. & O. R. R. for all points West and Southwest; also with the Erie R. R. for all Eastern points; at Bradford with the Narrow Gauge system to all points in the Oil Regions.

JAS. T. GARDNER, Supt. I. S. EMERY, Gen. Pass. Agt.

Warren and Farnsworth Valley Railroad.

Narrow Gauge Railroad to Garfield, Vandergrift and Dunham's Mills.

	A. M.	P. M.		A. M.	P. M.
Clarendon, Lv.	10 35	5 10	Garfield, Lv.	7 20	3 15
Garfield, Ar.	11 35	6 10	Clarendon, Ar.	8 20	4 15

Trains are run on P. & E. R. R. time. Passengers can leave Oil City and Titusville for Garfield by morning train, remain three and one-half hours in Garfield and return same evening.

A. D. WOOD, General Manager.

PETROLEUM REAL ESTATE CO.

C. D. ANGELL,

OFFICE: 59 MAIN ST., BRADFORD, PA.

Buy, sell and lease all kinds of Oil Lands and City Property, Negotiate Contracts and do a General Commission Business. Information carefully given. Address Lock Box 1275.

BRADFORD, BORDELL & KINZUA

AND

Bradford, Eldred & Cuba Railroad.

May 29, 1887.

WEST.				STATIONS.				EAST.			
Exp.	Mail.	P. M.	A. M.	Ar.	Lv.	Exp.	Mail.	A. M.	P. M.	Ar.	Lv.
5 20	11 50			Bradford	Lv.	7 25	2 25				
4 45	11 15			" Kinzua Junction	"	8 05	3 05				
4 38	11 10			" McCalmont	"	8 10	3 10				
4 36	11 08			" Rew City	"	8 13	3 12				
4 13	10 48			" Rixford	"	8 31	3 28				
4 08	10 43			" Duke Centre	"	8 36	3 33				
3 50	10 25			" Eldred	"	8 55	3 50				
3 32	10 10			" Bullis Mills	"	9 10	4 05				
3 17	9 54			" Ceres	"	9 26	4 21				
3 04	9 40			" Little Genesee	"	9 40	4 35				
2 55	9 30			" Bolivar	"	9 50	4 45				
2 34	9 06			" Allentown	"	10 14	5 09				
2 05	8 35	Lv.		" Wellsville	Ar.	10 15	5 40				
P. M.	A. M.	Ar.	Lv.	Ar.	Lv.	A. M.	P. M.	Ar.	Lv.	Ar.	Lv.
7 30	10 45	Ar.		Bradford	Lv.	8 30	5 15				
6 55	10 10	"		" Kinzua Junction	"	9 10	5 55				
6 47	10 02	"		" Aiken	"	9 17	6 03				
6 41	9 56	"		" Davis	"	9 23	6 08				
6 35	9 50	"		" Simpson	"	9 30	6 15				
6 25	9 40	"		" Ormsby	"	9 40	6 25				
5 50	9 03	"		" Smethport	"	10 15	7 00				
5 50	9 05	"		" Mt. Jewett	"	10 15	7 00				
5 15	8 30	Lv.		" Kane	Ar.	10 50	7 35				

Sunday Train leaves Smethport at 8:25 p. m., arriving at Bradford at 10 a. m. Returning leaves Bradford at 3:30 a. m., arriving at Smethport at 5:10 p. m.

JOHN C. MCKENNA, Superintendent.

W. H. DUFUR, Chairman.

JAS. B. BERRY, Secretary and Treasurer.

THE ASTRAL REFINING CO.,
LIMITED.

Refiners and Producers of Petroleum,
ALL QUALITIES OF
Illuminating, Lubricating Oils, Naphthas and Gasoline,
OIL CITY, PENN'A.

Manufacturers of "Water White Astral Oil," 48 to 49 Gravity, 50 Fire Test.

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ATTORNEY AT LAW,
Solicitor of Patents and Attorney in Patent Causes.

ROOM NO. 3,

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FOR OIL OR GAS WELL PACKERS

SEND YOUR ORDERS TO

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Who will fill them promptly with

The Best Malleable Iron Frame and Superior Quality of Rubber.

He Makes a Specialty of the Packer Business and Can Give You

Anything in that Line.

H. A. MARLIN & CO.,
PETROLEUM BROKERS
BRADFORD AND NEW YORK.

WHEELING AND LAKE ERIE
And Cleveland and Marietta R. R's.

Time Table—In effect Nov. 1, 1886. Central Standard Time.

EASTWARD.		No. 5.	No. 7.	No. 9*	No. 1*
Toledo.....Lv	7 45a. m.	1 00p. m.	4 50p. m.	-----	-----
Oak Harbor.....Ar	8 41	1 53	5 45	-----	-----
Fremont.....	9 07	2 18	6 08	-----	-----
Clyde.....	9 24	2 34	6 23	-----	-----
Bellevue.....	9 40	2 48	6 37	-----	-----
Monroeville.....Lv	9 58	3 05	7 01	3 10a. m.	-----
Norwalk.....	10 15	3 22	7 17	3 22	-----
Wellington.....	11 05	4 13	8 08	4 03	-----
Creston.....Ar	11 53	5 05	8 55p. m.	3 47	-----
Orrville.....Ar	12 20p. m.	5 35	5 15a. m.	5 15*	-----
Orrville.....Lv	12 40	5 40	7 00	7 00	-----
Massillon.....Ar	1 20	6 20	7 42	7 42	-----
Massillon.....Lv	1 20	6 20	7 42	7 42	-----
Navarre.....	1 35	6 35	8 00	8 00	-----
Valley Junction.....Lv	2 15	7 20	8 45	8 45	-----
New Cumberland.....	2 28	7 33	9 05	9 05	-----
Sherrods ville.....	2 40	7 45	9 25	9 25	-----
Leesville.....	2 48	7 53	9 40	9 40	-----
Bowerston.....Ar	2 55p. m.	8 00p. m.	9 50a. m.	9 50a. m.	-----
Canal Dover.....	2 42p. m.	5 52a. m.	-----	-----	-----
Newcomerstown.....	4 28	6 30	-----	-----	-----
Cambridge.....	5 25	7 30	-----	-----	-----
Macksburg.....	6 56	9 03	-----	-----	-----
Marietta.....Ar	8 10p. m.	10 15a. m.	-----	-----	-----

WESTWARD.		No. 6.	No. 8.	No. 4.	No. 2*
Marietta.....Lv	6 50a. m.	12 15p. m.	-----	-----	-----
Macksburg.....	8 04	1 26	-----	-----	-----
Cambridge.....	9 40	3 00	5 30a. m.	-----	-----
Newcomerstown.....	10 50	4 00	6 20	-----	-----
Canal Dover.....	11 32a. m.	4 40p. m.	6 55	-----	-----
Bowerston.....	11 25a. m.	3 45p. m.	6 30a. m.	-----	-----
Leesville.....	11 32	3 55	8 15	-----	-----
Sherrods ville.....	11 40	4 10	8 55	-----	-----
New Cumberland.....	11 55	4 25	8 55	-----	-----
Valley Junction.....	12 20p. m.	5 02	9 25	-----	-----
Navarre.....	12 50	5 35	10 12	*	-----
Massillon.....	1 05	5 10	11 25	7 25a. m.	-----
Orrville.....Ar	1 40	8 20	11 37	7 37	-----
Orrville.....Lv	1 45	10 15*	11 55	7 53	-----
Creston.....Lv	2 18	10 45	12 10p. m.	8 08	-----
Wellington.....	3 05	11 28	12 30	8 25	-----
Norwalk.....	3 55	12 10	12 55	8 48	-----
Monroeville.....	4 07	12 25a. m.	1 55p. m.	9 45a. m.	-----
Bellevue.....	4 23	*	-----	-----	-----
Clyde.....	4 39	-----	-----	-----	-----
Fremont.....	4 55	-----	-----	-----	-----
Oak Harbor.....	5 20	-----	-----	-----	-----
Toledo.....Ar	6 15p. m.	-----	-----	-----	-----

No. 29.	No. 27.	NORWALK & HURON.		No. 26.	No. 28.
5 15p. m.	11 40a. m.	Ar.....	Huron.....Lv	6 25a. m.	2 05p. m.
4 30p. m.	10 45a. m.	Lv.....	Norwalk.....Ar	7 15a. m.	3 00p. m.

* Daily.

This road is now open through from Toledo to Bowerstown, connecting with the Pennsylvania System for all points East.
THROUGH CAR SERVICE—Between Toledo, Cambridge and Marietta; Toledo and Bowerstown; Toledo and Akron, Youngstown and Pittsburgh; Chicago, Akron, Youngstown and Pittsburgh.
M. D. WOODFORD, General Manager. JAMES M. HALL, Gen'l. Pass. Agent

Philadelphia & Erie Railroad.

Time Table in Effect Nov. 15, 1886. | Eastern Standard Time.

EASTWARD.		Kane Express No. 18.	Day Express No. 8.	Erie Mail No. 4.	Kane Accom. No. 12.
Erie	Lv.	7 35 a m		2 45 p m	5 25 p m
Corry	"	9 00 "		4 13 "	6 55 "
Irvinton	"	9 50 "		5 00 "	7 50 "
Warren	"	10 05 "		5 15 "	8 05 "
Kane	Ar.	11 25 "		6 30 "	9 15 "
Kane	Lv.		6 25 a m	6 55 "	
Johnsonburg	"		6 58 "	7 30 "	
Emporium Junction	"		8 30 "	9 15 "	
Lock Haven	"		11 15 "	11 58 "	
Williamsport	"		12 20 p m	1 25 a m	
Harrisburg	Ar.		3 13 "	4 30 "	
Philadelphia	"		6 50 "	8 25 "	
WESTWARD.		Erie Accom. No. 11.	Erie Mail No. 3.	Niagara Express No. 11.	Erie Express No. 17.
Philadelphia	Lv.		11 25 p m	7 40 a m	
Harrisburg	"		3 30 a m	11 25 "	
Williamsport	"		7 10 "	2 25 p m	
Lock Haven	"		7 58 "	3 15 "	
Emporium Junction	"		10 30 "	6 25 "	
Johnsonburg	"		12 00 m	8 02 "	
Kane	Ar.		12 40 p m	8 35 "	
Kane	Lv.	6 35 a m	1 00 "		4 10 p m
Warren	"	7 45 "	1 58 "		5 25 "
Irvinton	"	7 58 "	2 09 "		5 45 "
Corry	"	8 55 "	2 56 "		6 45 "
Erie	Ar.	10 10 "	4 00 "		8 05 "

Trains daily except Sunday.

THROUGH-CAR ARRANGEMENT WESTWARD—Erie Mail—Pullman Palace Sleeping Cars Philadelphia to Erie, and Philadelphia to Williamsport (cars open to receive passengers at Philadelphia at 10 00 p m), and Washington to Williamsport. Passenger Coaches from Philadelphia to Erie, and Baltimore to Williamsport.

Niagara Express—Pullman Parlor Car Philadelphia to Williamsport.

THROUGH-CAR ARRANGEMENT EASTWARD—Day Express—Pullman Parlor Car Williamsport to Philadelphia. Passenger Coaches Kane to Philadelphia, and from Williamsport to Baltimore.

Erie Mail—Pullman Sleeper Erie to Philadelphia, and Williamsport to Philadelphia. (Car open to receive passengers at Williamsport at 9 00 p m.) Passenger Coaches Erie to Philadelphia, and Williamsport to Baltimore. Sleeping Car Williamsport to Washington.

W. & W. R. R. TIME TABLE.

DECEMBER 27, 1886.

NORTHWARD		STATIONS.	SOUTHWARD	
No. 3	No. 1		No. 2	No. 4
P. M.	A. M.		A. M.	P. M.
2 00	6 00	Lv. Wayneburg	10 35	6 25
2 15	6 15	Sycamore	10 17	6 07
2 23	6 23	Swart	10 09	5 59
2 30	6 30	Deer Lick	10 02	5 52
2 38	6 38	West Union	9 53	5 43
2 47	6 47	Dunn	9 43	5 33
2 50	6 50	Lindley's Mills	9 40	5 30
3 01	7 02	West Amity	9 28	5 18
3 06	7 08	Luellen	9 22	5 12
3 11	7 13	Baker	9 17	5 07
3 14	7 20	McCracken	9 13	5 00
3 27	7 35	Vankirk	9 00	4 47
3 40	7 50	Braddock	8 48	4 33
3 55	8 05	Washington	8 35	4 20
6 36	9 55	Pittsburg	6 10	1 55
		P. C. & St. L. R. R.		

Time given above is Central Standard, which is 40 minutes slower than Pittsburg or local time, or one hour slower than Eastern time.

The Company reserve the right to vary from this schedule as circumstances may require. All trains daily except Sunday.

C. E. BOWER, Superintendent.

JOHN F. STRATTON,

49 Maiden Lane,

New York.



Importer, Manufacturer and Wholesale Dealer in all kinds of Musical Merchandise, Musical Boxes, Band Instruments. Stratton's Celebrated Russian Gut Violin Strings.



BANJO.

The PITTSBURG & WESTERN RAILROAD Time Table

NORTHERN DIVISION.

SOUTHBOUND TRAINS.

STATIONS.		27		17	
		P. M.	A. M.	A. M.	
Bradford	Lv.			6 00	
Mt. Jewett	Lv.			7 40	
Kane				10 10	
Sheffield Junction				11 04	19
Marienville				11 47	P. M.
Tylersburg				12 27	
Clarion Junction			6 20	1 14	4 00
Clarion			6 50	12 35	3 30
Shippenville	23		6 30	1 28	4 14
Knox			6 45	1 45	4 33
St. Petersburg		A. M.	7 24	2 30	5 20
Foxburg		5 40	7 38	3 00	5 40
Parker		5 50	7 48	3 10	
Bruin		6 08	8 06	3 31	P. M.
Petrolia		6 18	8 17	3 45	
Karns		6 22	7	8 22	3 50
Millerstown		6 36		8 36	4 07
St. Joe		6 50	A. M.	8 50	4 25
Butler		7 18	5 15	9 30	5 25
Renfrew		7 39	5 28	9 46	5 45
Callery Junction		8 05	5 50	10 10	6 05
Allegheny	Ar.	9 30	7 10	11 20	7 20
		A. M.	A. M.	P. M.	P. M.

NORTHBOUND TRAINS.

STATIONS.		28	8	18	24	26
		A. M.	A. M.	A. M.	P. M.	P. M.
Allegheny	Lv.	3 15	9 20	7 20	12 40	5 35
Callery Junction		4 40	10 40	8 35	1 50	6 50
Renfrew		5 02	11 00	8 55	2 13	7 12
Butler		5 20	11 20	9 15	2 36	7 30
St. Joe				9 45	3 08	8 00
Millerstown			A. M.	10 00	3 23	8 14
Karns				10 15	3 38	8 28
Petrolia			20	10 20	3 45	8 32
Bruin				10 32	3 56	8 43
Parker			A. M.	10 52	4 15	9 00
Foxburg			6 25	11 25	4 40	9 10
St. Petersburg			6 44	11 41	4 54	
Knox			7 49	12 32	5 40	
Shippenville			8 11	12 53	5 58	
Clarion Junction			8 30	1 14	6 10	
Clarion			9 00	1 45	6 40	
Tylersburg				1 48		
Marienville				2 26		
Sheffield Junction				3 06		
Kane	Ar.			3 58		
Bradford	Ar.			4 40		
		A. M.		P. M.	P. M.	P. M.

Westbound trains leave Callery Junction as follows:

Cleveland and Toledo Express 8.35 a. m., New Castle Accommodation 4.43 p. m., Chicago Express, with through Sleeping Car 1.44p. m., Zelenople Accommodation 6.55 p. m.

No. 17 makes direct connection at Allegheny with B. & O. R. for Washington and Baltimore.

No. 19 connects at Foxburg with A. V. R. R. for Franklin and Oil City.

SUNDAY TRAINS Nos. 23 and 26 will run daily. Nos. 18 and 17 will run daily between Butler and Allegheny. No. 23 connects at Callery Junction for Allegheny and New Castle. No. 26 gets connections from Allegheny and New Castle. All other trains run daily, except Sunday.

THOS. M. KING, General Manager.

C. W. BASSETT, General Passenger Agent.

DUNKIRK, ALLEGHENY VALLEY & PITTSBURGH R.R.

Going North.		Express No. 2.	Mail No. 4.	Sunday No. 6.
Titusville, leave		7 35a.m.	3 20p.m.	7 35a.m.
Grand Valley		8 03a.m.	3 48p.m.	8 01a.m.
Irvinton		8 45a.m.	4 36p.m.	8 44a.m.
Warren		8 58a.m.	4 53p.m.	8 56a.m.
Junction		9 55a.m.	5 45p.m.	9 48a.m.
Lily Dale		10 50a.m.	6 36p.m.	10 37a.m.
Dunkirk, arrive		11 25a.m.	7 10p.m.	11 12a.m.
Going South.		Mail No. 1.	Express No. 3.	Sunday No. 5.
Dunkirk, leave		9 25a.m.	4 00p.m.	2 40p.m.
Lily Dale		10 03a.m.	4 38p.m.	3 14p.m.
Junction		11 02a.m.	5 45p.m.	4 08p.m.
Warren		11 55a.m.	6 44p.m.	5 06p.m.
Irvinton		12 10a.m.	7 00p.m.	5 22p.m.
Grand Valley		12 58p.m.	7 49p.m.	6 12p.m.
Titusville, Ar		1 20p.m.	8 15p.m.	6 40p.m.

THE PETROLEUM AGE.

VOL. VI.

BRADFORD, PA., AUGUST, 1887.

No. 7.

PETROLEUM DEVELOPMENTS DURING 1886.

FROM ADVANCE SHEETS OF THE OIL REGION REPORT
OF 1886.

BY JOHN F. CARLL.

THE chapters on oil and gas published in the last Annual Report of the Geological Survey were prepared in November, 1885, and consequently the general review of the situation in the field and the statistics of production were only brought up to the first of that month. This report is dated January 1, 1887; and as a preliminary to the geological facts and details that are to be presented, it will be both interesting and instructive to briefly consider what the results of fourteen months' active developments have been—how they have affected the old districts, what new fields have been opened, what new discoveries made by the drill—for from these actually demonstrated facts which cannot be gainsayed we ought to be able to draw some deductions of value in relation to the question of future supplies in the oil regions of Pennsylvania. It may be, also, that these deductions, based upon the logic of practical experience, will be thought worthy of some consideration even by those who profess to believe that the oil supply is practically inexhaustible, and who are ever ready to treat all purely geological opinions upon the subject with supercilious contempt.

ALLEGANY COUNTY, N. Y.

Active operations in this field during the last fourteen months have pretty thoroughly developed it without bringing to notice any new geological features or adding to the daily output of oil, as the following figures prove:

Average daily production for Oct., 1885.....	6,747 bbls.
“ “ “ Dec. 1886.....	5,178 “
“ “ decrease in 14 months.....	1,569 “

Meantime, according to THE PETROLEUM AGE (which publishes monthly a careful list of wells completed, giving location, owners' names and the quantity of oil each well produced on the last day of the month in which it commenced to produce) 405 new wells were drilled (47 of them dry) having an aggregate daily production of 2191 barrels,* as seen in detail in the table on page 1695.

In October, 1885, the number of producing wells in the Allegany district was estimated in the AGE at 3980. Since then 358 productive wells have been added, making 4338 to account for January 1, 1887. Analyzing these figures we find that an *increase* of 9 per cent. in the number of wells has resulted in a *decrease* of 23 per cent. in the average daily production.

BRADFORD OR M'KEAN DISTRICT.

The results of thorough exploitation and long-continued depletion are now manifesting themselves in this wonderfully productive and tenacious district as plainly as in Allegany county. With a wide productive area, a

*That is, these wells, if they had continued to produce at the same rate they were yielding on the last day of the month in which they were completed, would have been producing an aggregate of 2191 barrels on the 31st of December, 1886.

thick sand-rock of fine grain, which yields its oil slowly, but responds generously to repeated torpedoing, and a large number of wells that can be operated cheaply—it is likely to hold its position as the banner district of the State for several years; but unless deeper drilling should disclose some new oil horizon, its future history can only be a continuation of the story of gradual decline and exhaustion, already partly told by the following statistics:

Average daily production for Oct., 1885.....	30,180 bbls.
“ “ “ Dec. 1886.....	22,422 “
“ “ decrease for 14 months.....	7,758 “

Meantime 544 new wells (43 of them dry) have been drilled, having an aggregate daily production of 3,913 barrels. October, 1885, 13,635 wells producing a daily average of 30,180 barrels. December, 1886, 14,136 wells producing a daily average of 22,422 barrels.

An *increase* of about 3½ per cent. in the number of wells and a *decrease* of 25 7-10 per cent. in average daily production.

KANE DISTRICT.

This is a new “black sand” field located in the southwestern part of McKean county and extending a little across the line into Elk. Sand was struck in the first well, the Clemenger or Craig & Cappeau No. 1, on the 11th of November, 1885; but the well was not “drilled in” until the 11th of December, on which date it produced about 95 barrels.

Up to the 1st of January, 1887, 372 wells (22 of them dry) had been drilled in the district, having an aggregate daily production, as reported by the AGE, of 15,654 barrels.

The productive area is now outlined and the output decreasing.

At its maximum, in June the average pipe line runs were 5702 barrels per day from 174 wells; in December, 3607 barrels from 350 wells. Total production to January 1, 1887, 1,284,647 barrels.

The oil is here found in a brown sand very similar in appearance to the Bradford oil sand, but evidently not the same stratum, since it lies geologically several hundred feet below the Bradford sand horizon. It is the lowest productive oil horizon thus far developed in the State, and as traces of it were found in a number of “wildcat” wells in Elk county several years ago, the drill has been actively at work in that section all the past year seeking for another oil pool. From all that can be learned about these developments, however, nothing better than a 10-barrel well has yet been obtained.

WARREN AND FOREST DISTRICT.

The several sub-divisions of this field have been pretty thoroughly exploited during the last fourteen months, without the discovery of any new pools. The following figures show some of the results:

	Wells drilled.	Dry.	Product'n
Kinzua Village, Warren, &c.....	132	31	1,273 bbls.
Clarendon.....	246	7	1,336 “
Tiona.....	278	8	1,662 “
Cooper.....	28	7	279 “
Balltown.....	73	11	1,647 “
Grand Valley.....	345	33	3,332 “
Totals.....	1,192	97	9,529 “

Stowell's Petroleum Reporter gives the "Warren and Forest" district a daily average production of 7180 barrels in October, 1885. For December, 1886, it gives to the "Warren" district (which appears to include Kane) a daily production of 10,855 barrels. After deducting Kane (3607 barrels) we have 7248 barrels per day to represent the district called Warren and Forest in October, 1885, an increase of 68 barrels a day in the sub-divisions mentioned above. The insignificance of this increase seems startling when we consider the fact that 1092 wells have been drilled and 9529 barrels of new production added to secure it.

VENANGO, CLARION AND BUTLER.

The results of very active development and a great deal of deep drilling in these old fields, during the period under review, have been the discovery of the Tarkill and Tipperary pools and the depletion of the Red Valley pool in Venango county; the opening of the Reibold pool and several other prolific pockets and spurs in Butler county, and the culmination and decline of operations in the Cogley Run pool of Clarion county—all of them yielding from the Venango oil group.

The deep drilling proves that the Speechley gas sand spreads out under a large extent of country, but so far no very promising indications of its being an oil producer have been discovered, although several wells have made a considerable show of oil. It seems to show also that if there are other oil horizons beneath the Venango oil group, they are not easily found in this part of the country.

Between November 1, 1885, and January 1, 1887, 1475 new wells were drilled in this district, to-wit:

	Wells.	Dry	Production.
Venango	693	173	12,961 bbls.
Clarion.....	385	60	6,006 "
Butler.....	397	94	10,166 "
Totals.....	1,475	327	29,133 "

But with this large number of new wells and this great addition to the production, the increased output is not nearly as much as might reasonably have been expected. Grand Valley pool in Warren county, Tarkill and Red Valley in Venango county, Cogley in Clarion county and Pontius in Butler county—all pools of more than ordinary promise—have reached their maximum output during the months under review and fallen into a fatal decline, which threatens ere long to reduce the production of the district below what it was in October, 1885.

Lower Dist. daily average, Oct., 1885, (<i>Stowell's Reporter</i>)	Barrels.
" " " " Dec. 1886, " "	22,728
	26,530

Increase in daily production..... 3 802

This seems to indicate that the drilling of 1475 wells, which had a production of their own (as estimated on the last day of the month in which they were completed) of 29,133 barrels, increased the previous output of 22,728 barrels by 16 7-10 per cent—but we shall see presently that this increase is probably overstated.

SHANNOPIN DISTRICT.

This is a new field lying along the dividing line between Allegheny and Beaver counties, and coming into prominence since February, 1886. Its oil is derived from the lower part of the Venango oil group, which in this locality seems to be "spotted" or unreliable, as shown by the large proportion of dry holes to productive wells.

June,	daily	average	runs,	46	wells	drilled,	(26	dry)	272	barrels.
Oct.,	"	"	"	97	"	"	42	"	4,401	"
Dec.,	"	"	"	132	"	"	48	"	3,031	"

The aggregate production of the field up to January 1, 1887, is given at 483,338 barrels.

The district seems already to have arrived at that stage of development where an increase of wells is unable to check a declining production. It may lead out,

however, into other pools, but if it does we have no good reason to expect that they will be larger or more enduring than this. The new production of the 132 wells drilled was 9591 barrels.

WASHINGTON DISTRICT.

Sand was struck in the first oil well in this district—the Gantz well—January 1, 1885, but active developments did not commence until after the Gordon well (which was drilled for gas) found oil in large quantities and in a deeper sand than the Gantz sand. This was in the latter part of August, 1885, and inasmuch as the drilling was deep, troublesome and expensive the next wells came in slowly, and in February, 1886, the first pipe line runs are reported, averaging 497 barrels per day. The principal part of the oil comes from the “Gantz sand” and “50-foot rock” lying in the horizon of the first sand of the Venango oil group. Large wells have been obtained also in the “Gordon sand” lying near the bottom of the group, and likewise in one or two exceptional instances in the basal rocks of the carboniferous series above the oil group.

The following figures from THE PETROLEUM AGE give some intimation of what may be expected from that part of the field now under the drill:

Feb., 1886,	average daily runs, 6 wells drilled	497 bbls.
Sept.,	" " " " 94 " (20 dry)	13,143 "
Dec.,	" " " " 157 " (36 dry)	8,841 "

Total runs to January 1, 1887, 2,418,872 barrels. Total new production from 157 wells, 32,707 barrels.

Several very deep wells have been drilled in this district, but no oil-producing rocks have been found below the Venango oil group.

RECAPITULATION.

	New Wells.....	Dry.....	New Production	Increase	Decrease.....
Alleghany, N. Y., McKean group, "black sand".....	405	47	2,191	-----	1,569
Bradford, McKean group, "black sand".....	544	43	3,913	-----	7,758
Kane, Elk group, "black sand".....	372	22	15,654	3,607	-----
Warren and Forest, Warren group, "white sand".....	1,092	97	9,529	68	-----
Venango and Butler, Venango group, "white sand".....	1,475	327	29,133	3,802	-----
Shannopin, Venango group, "white sand".....	132	48	9,591	3,031	-----
Washington, Venango group, "white sand".....	157	36	32,707	8,841	-----
Miscellaneous	91	62	198	198	-----
Result of 14 months' operations	4,268	682	102,916	19,547	9,327

These figures show an apparent increase of 10,220 barrels in the average daily production of the whole oil field since October, 1885. But this is considerable larger than the actual increase, as shown by the systematic reports of THE PETROLEUM AGE. page 1528:

Total daily production	Dec., 1886.....	66,383 barrels.
“ “	Oct., 1885.....	60,088 “
“ “ increase	.....	6,295 “

This discrepancy is due to the use of figures from the *Petroleum Reporter* in estimating the present production of Warren and Forest and Venango and Butler districts. The AGE says the average daily production of Allegany and Bradford in December, 1886, was 27,600 barrels. the *Reporter* 22,710 barrels. Still the *Reporter* gives a total average production for the month about 4,000 barrels in excess of the AGE, and it is evident that this result could not be arrived at without accrediting too much production to the white sand fields.

A reduction to the AGE's figures (and they are undoubtedly nearest the truth) would wipe out all increase

in the old districts and show the gains to be derived entirely from the new—thus:

Kane (new field) production in Dec., 1886.....	3,607 bbls.
Shannopin (new field) production in Dec., 1886.....	3,031 "
Washington (new field) production in Dec., 1886.....	8,841 "
Miscellaneous production in Dec., 1886.....	198 "

Total daily production of new fields.....	15,677 "
Deduct decrease in Allegany and Bradford.....	9,327 "

Net increase in all the fields.....	6,350 "
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Taking this view of the situation, it appears that the drilling of 2567 new wells (having an aggregate daily production of 38,662 barrels) in the old "white sand" districts between Bradford and Southern Butler, simply neutralized the decline of the old wells and left the field in December, 1886, with about the same average output that it had in October, 1885. A similar result is shown by the figures of aggregate production:

Total production for the year 1886, (see below).....	25,080,460 bbls.
" " " " 1885, (see oil chart).....	20,900,000 "

Increase.....	4,180,460 "
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All of which seems to have been furnished by the new pools developed in 1886, to-wit:

Kane, total production, 1886.....	1,284,647 bbls.
Shannopin, total production, 1886.....	483,338 "
Washington, total production, 1886.....	2,418,872 "

Aggregate production, 1886.....	4,186,857 "
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Total production of the Pennsylvania and New York oil fields from November 1, 1885, to January 1, 1887, according to monthly averages given in PETROLEUM AGE, page 1528: *

Nov., 1885.	Daily average, 61,444 bbls.	Total production, Barrels.
Dec., " "	59,603 "	1,843,320
Jan., 1886.	57,272 "	1,847,693
Feb., " "	57,840 "	1,775,432
Mar., " "	59,764 "	1,619,520
Apr., " "	63,027 "	1,852,684
May, " "	68,198 "	1,890,810
June, " "	74,454 "	2,114,138
July, " "	73,887 "	2,233,620
Aug., " "	76,657 "	2,290,497
Sept., " "	78,228 "	2,376,367
Oct., " "	77,009 "	2,346,840
Nov., " "	71,180 "	2,387,279
Dec., " "	66,383 "	2,135,400
		2,057,873

Total production 14 months.....	28,771,473
Deduct November and December, 1885.....	3,671,013

Total production in 1886.....	25,100,460
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Some interesting hints may be obtained by looking at the results in still another light. If the wells of October, 1885, which were producing at that time an average of 60,088 barrels per day, had maintained a steady output during the next 426 days they would have produced by the 1st of January, 1887, a total of 25,597,488 barrels; and if the new wells drilled had continued to yield as they were yielding on the last day of the month in which they were completed, they would have made an aggregate of 18,522,529 barrels, as below:

Nov., 1885.	New prod., Barrels.	396 days to Jan. 1, 1887, Barrels.
Dec., " "	3,886 365	1,814,868
Jan., 1886.	2,983 334	1,418,390
Feb., " "	3,352 306	996,322
Mar., " "	5,205 275	1,025,712
Apr., " "	8,782 245	1,431,375
May, " "	11,588 214	2,151,590
June, " "	9,027 184	2,479,832
July, " "	10,119 153	1,660,968
Aug., " "	13,790 122	1,548,207
Sept., " "	13,540 92	1,682,300
Oct., " "	6,574 61	1,245,680
Nov., " "	5,361 31	401,014
Dec., " "	4,126 0	166,191

Totals.....	102,916
Production of the wells during month of completion, say,.....	18,022,529
Total.....	18,522,529

Prospective production from old wells.....	25,597,488 bbls.
new " ".....	18,522,529 "

Total prospective production.....	44,120,017 "
Total production realized.....	28,771,473 "

Shrinkage.....	15,348,544 "
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Equal to 34¾ per cent. of the prospective and 53.34 per cent. of the actual production.

We have seen above that the new pools of Kane, Shannopin and Washington furnished all the increased production of 1886; from which it would appear that the old districts of Allegany, Bradford, Warren and Forest and Venango and Butler held their ground during the last 14 months, having been reinforced by 3607 new wells (576 of them or about 16 per cent. being dry) which added a new production aggregating 44,766 barrels per day. But it is to be noticed that although these new wells, many of them drilled in rich pools like Grand Valley, Tarkill, Red Valley, Cogley and Pontius, added largely to the output for a short time, they soon fell off in production, so that the old fields were making a much lower daily average in December, 1886, than they were in October, 1885, as seen below:

Average daily production December, 1886.....	66,383 bbls.
Deduct daily production of new fields December, 1886.....	15,677 "

Average daily production of the old fields Dec., 1886.....	50,706 "
" " " " Oct., 1885.....	60,088 "

Shrinkage in daily production.....	9,382 "
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A decrease in 14 months of 9382 barrels per day in the old oil fields, notwithstanding the large number of wells put down, and the assistance of the five or six very promising pools that have come under the drill.

Total production of the Pennsylvania and New York oil fields from August, 1859, to January 1, 1887:

Total to Jan. 1, 1885, (Oil Chart No. 1, published in 1885).....	248,783,000 Barrels.
" " production in 1886 (PETROLEUM AGE, page 1531).....	25,435,505

Grand total to January 1, 1887.....	310,218,505
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Divided among the several districts and pools as follows.

	Barrels.
Allegany, N. Y.....	20,483,809
Bradford, Pa.....	131,713,911
Kane, Pa.....	1,284,647
Total from "black sand" district.....	153,482,367
Cherry Grove, Warren county.....	3,610,539
Cooper, Warren and Forest.....	2,672,650
Balltown, Forest county.....	2,280,860

Total from "white sand" pools of Warren and Forest.....	8,564,049
Tarkill, Venango county.....	559,564
Red Valley, Venango county.....	358,391
Cogley, Clarion county.....	1,723,294
Pontius, Butler county.....	560,780
Thorn Creek and Baldrige, Butler county.....	3,484,096

Total from "white sand" pools of Venango, Clarion and Butler.....	6,686,125
Total from other parts of Warren and Forest and Venango and Butler.....	138,583,754
Shannopin, Beaver and Allegheny county.....	483,338
Washington, Washington county.....	2,418,872

Total from new southern "white sand" pools.....	2,902,210
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Grand total of all fields to January 1, 1887.....	310,218,505
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These figures of development and production, however faulty they may be, and in whatever way they are studied, show most unmistakably that the great Pennsylvania oil fields which have supplied the world for years are becoming exhausted, and cannot respond to the heavy drafts made upon them many years longer, unless reinforced by new deposits from deeper oil horizons. Probably 55,000 drill holes, scattered all over the country from the Alleghenies to the lake, have been sunk in Pennsylvania and New York since oil developments commenced in 1859. They have given us a practical knowledge of three great groups of oil-bearing sand-

*NOTE—On page 1531 the total production for 1886 (exclusive of Macksburg) foots up 25,435,505 barrels, but no explanation is given to account for its disagreement with the monthly averages.

NOTE BY ED. PETROLEUM AGE—The production report on page 1528 of THE PETROLEUM AGE is computed from estimates of the increase or decrease in stocks at wells, and with no allowance made for dump oil, as therein stated. On page 1531 the production for 1886 consists of the runs by all pipe lines, with an addition of 290,418 barrels of dump oil, and no account taken of the difference in stocks at wells in the tanks of the producers. In comparing one year with another, the runs from the wells are the most convenient figures on the annual output.

rocks, each group occupying its own geographical area in which the rocks of the other groups are never productive. They have drawn from the black sands of the Bradford group, in about 12 years, 153,482,367 barrels of oil; and from the Warren and Forest white sand group, in 11 years, and the old Venango oil group, in 27 years, an aggregate of 156,736,138 barrels. These three great oil-bearing horizons have been exploited in every direction until the outlines of production seem to be pretty definitely defined. On the ranges of best development they have been thoroughly covered with drill-holes, and now, in glancing over the several fields, we find the production in every one of them declining, and nothing new of importance in sight. No doubt many good pools yet lie undiscovered in these old oil horizons within the boundaries of the State, and possibly some deeper productive strata may be found; but developments so far give very little promise of finding them immediately beneath the old oil belts.

The demands of consumption are now so large that the production of old wells alone, numerous as they are, would come far short of meeting them. Several new pools like those recently discovered are needed each year to keep up the output. The above table shows that the celebrated pools of Cherry Grove, Cooper, Balltown, Tarkill, Red Valley, Cogley, Pontius, Thorn Creek and Baldrige, Shannopin, Washington and Kane have produced during their whole lives (and some of them are over four years old) only about three-quarters of the quantity of oil actually shipped out of the oil regions in the year 1886. It is to be noticed also, that the renowned Allegany field, in New York, now over five years old and perforated by about 4200 drill-holes, has produced up to the present time barely sufficient oil to satisfy the current demands of 1886 for ten months.

The number of new wells drilled and the estimated amount of new production from October, 1885, to January, 1887:

	Wells.....	New production in barrels.....
Allegany	*47 358	2,191
Bradford	43 501	3,913
Kane.....	22 350	15,654
Kinzua, &c.....	31 101	1,273
Clarendon.....	7 239	1,336
Tiona.....	8 270	1,662
Cooper.....	7 21	279
Balltown.....	11 62	1,647
Grand Valley.....	53 302	3,332
Venango	173 520	12,961
Clarion.....	60 325	6,006
Butler and Armstrong.....	94 303	10,166
Shannopin	48 82	9,591
Washington.....	36 121	32,707
Miscellaneous.....	62 29	198
Total.....	4,268	102,916
Dry wells.....	382	

*Upper figures, dry holes; lower figures, productive wells.
REVIEW OF THE GAS POOLS.

A great many wells have been drilled for natural gas in the western portion of the State during the last 14 months, but as far as known no new sources of supply

have been brought to light. The gas pressure in Alleghany and Bradford have gradually weakened. Potter county has added several more wells to her list of failures, and the Wilcox gas pool now stands as the most northeasterly one of importance in the State. In the latter quite a number of new wells have been sunk to increase the supply to meet the requirements of the new line recently laid to Buffalo, N. Y. One of the peculiarities of this district is that there are two gas-bearing sand rocks separated by about 100 feet of shale. Two wells half a mile apart may produce gas from the upper rock and none from the lower, while an intermediate one produces none from the upper and large quantities from the lower. These sands lie below the Bradford sand (which here, sometimes, produces a little oil) and probably belong to the same general horizon as the gas sands at Kane and in Elk county; but the well records of this region have been so carelessly kept that it is impossible to make precise identifications. A very large area of possible gas territory remains to be explored in this region.

In the Sheffield gas field nothing new has transpired. The pool is large, well stored, and shows its ability to furnish many wells and maintain a steady output.

The Speechley gas sand in southeasterly Venango county is now known to have an extensive range. It has been traced from Tionesta, in Forest county, to Black's Station, on the A. V. R. R., in Rockland township, Venango county, a distance of about 24 miles. Some productive wells have been obtained at the north within a few miles of Tionesta, but at Black's Station it is barren as far as developed.

The original Speechley pool and its immediate surroundings have been the scene of a great deal of activity during the last year. A large number of wells have been drilled and an enormous amount of gas allowed to waste, with the result, as admitted by those who are in a position to know, of a decided decrease of pressure in the pool.

In the Tarkill oil pool (about six miles from the Speechley well) a number of wells were drilled down to the Speechley sand, and gas obtained in such quantity and under such pressure that it could be conveyed directly from the wells into the cylinders of the engines at the drilling and pumping wells, and used in place of steam. For several months nearly all the engines in that locality were run in this manner. But latterly they have been compelled to fall back on steam, as the direct method of using gas is much more wasteful than the application of it in generating steam.

Some of the wells on this range have found water in the Speechley sand, almost to the exclusion of gas, and others have sprayed considerable oil—in some cases two or three barrels per day. This oil show has confirmed a number of operators in the belief that this sand is also an oil rock, and persistent efforts are now being made to find the oil-producing portions of it.

Speechley and Tarkill are within four or five miles of the old Gas City oil developments described in report L, pages 166 and 177, where engines were run by gas as early as 1870. But this gas came from the Venango oil group, which lies about 900 feet above the Speechley gas sand.

The Butler gas field has been quite widely developed during the period under review, and some parts of it promise to be of great importance. This gas comes from the Venango oil group and the gas sand above it.

The Tarentum gas field has evidently passed its prime. Excessive drilling and salt water in the rock have brought it to an early decline. It is now an open secret that some of the industries established near Tarentum on account of its gas deposits are now being supplied

from the Murrysfield—the mains laid for the purpose of conveying gas from Tarentum to Pittsburgh being used to carry gas to Tarentum.

The Murrysfield, Grapeville, Washington and Beaver fields—all drawing their gas from the Venango oil group (with the exception of a few wells in Washington county which get some gas also from the carboniferous sandstones)—have been drilled extensively and have responded so freely that the supply is not only ample for all the requirements of Pittsburgh and its surroundings, but sufficient also to be piped from Grapeville to Johnstown on the east, from Washington to Wheeling, &c., on the southwest, and from Beaver to Rochester, Beaver Falls and Youngstown on the north. The drafts for all these purposes are enormous, but the fields are large, and no doubt others will be found when the central ones weaken, so that an extension of lines will insure a supply for years to come.

OIL REGION CHRONOLOGY.

FOR JULY, 1887.

July 1.—AGE oil report shows 179 wells completed in June, 35 of which are dry; new production, 6380 barrels; new rigs, 67; old rigs, 108; drilling wells, 138; total field operations for June, 313; decrease from May figures, 36. Lima reports 15 wells completed in June, with a new production of 1255 barrels; two wells non-productive of oil; 14 wells were completed at Findlay. Market opened at $61\frac{1}{2}$ c, advanced slowly to $61\frac{7}{8}$ c and closed at $61\frac{3}{4}$ c. Carrying rates—Oil City, $37\frac{1}{2}$ c; Bradford, Pittsburgh and New York, 45c. All Exchanges except Oil City decide to hold Saturday as a holiday. McKeown No. 4, Martin farm, Washington, treated to a small shot and increased from 83 to 225 barrels an hour. Reibold—Phillips Nos. 3 and 4, Behm, 30 feet in the sand without oil. Root & Johnson No. 3, Blakeley, off to 50 barrels an hour. Reibold pool gauges 6370 barrels from 74 wells.

July 2.—No market at Bradford, Pittsburgh or New York. Oil City opened at $61\frac{1}{4}$ c, declined to $60\frac{7}{8}$ c and closed at 61c. McKeown's, Martin, No. 4, does 170 barrels an hour in forenoon and 150 barrels in the afternoon. Field gauge, 10,231 barrels from 190 wells.

July 3.—Sunday.

July 4.—Independence Day. General celebration at Bradford, Titusville, Warren and other points in the oil regions. Edward Clarage, an aeronaut, killed by a fall from a balloon at Olean. Entire business portion of Clarendon destroyed by fire. One thousand people made homeless and 281 buildings burned. Loss, \$500,000. Wm. C. McCutcheon, a pipe line gauger, fatally burned. Unknown person burned to death. Jessie Dell's castle at Oil City suffers \$2000 damages by fire.

July 5.—Market opened at $61\frac{1}{4}$ c, advanced to $61\frac{1}{2}$ c, broke to $60\frac{3}{4}$ c and closed at $60\frac{7}{8}$ c. Washington—Martin No. 4, 115 barrels per hour. Sadie Lawson shoots her false lover, James Burr, at Franklin. Both parties are colored. Burr will survive. Linden Burr, of Emporium, arrested for alleged attempts to blow up the City Hall and other buildings at Olean. George Wood, of Olean, aged 70, commits suicide by drowning. B. W. Greenfield, aged 17, accidentally shoots himself at Clarion. Farmers near Kokomo, Ind., do their harvesting by gas light. T. J. Mahoney arrested as alleged incendiary of the great Clarendon fire.

July 6.—Market opened at $60\frac{7}{8}$ c, fell off to $60\frac{1}{4}$ c and closed at $60\frac{3}{8}$ c. Carrying rates—Bradford and Pittsburgh, 40c; Oil City, 35c; New York, 50c. Martin No. 4, 120 barrels an hour. Warren subscribes \$4000 and

Oil City \$1200 for the relief of the sufferers by the Clarendon fire. Fire in the woods near Clarendon burns wells and rigs of Patrick Conner, Beatty Bros., and Anchor Oil Co. and others. Gas strike reported at Port Huron, Mich., at a depth of 200 feet. John Wilson, a brakeman on the B., N. Y. & P. R. R., fatally hurt by a train at Oil City.

July 7.—Market opened at $60\frac{3}{8}$ c, advanced to $61\frac{3}{8}$ c and closed at 61c. Carrying rates, 40@45c. Washington—McKeown, Martin, No. 4, 105 barrels an hour. General Manager Dan O'Day reports to a committee of Lima producers that up to date no refined oil has been produced from Lima oil that can be safely put on the market as an illuminant. Important meeting of pipe line superintendents at Buffalo.

July 8.—Market opened at $61\frac{1}{8}$ c, advanced to $61\frac{1}{4}$ c, broke to $60\frac{1}{4}$ c, made a partial recovery and closed at $60\frac{3}{8}$ c. Washington—McKeown, Martin, No. 4, by deeper drilling jumps from 105 to 170 barrels an hour. Big oil strike reported near Cygnet, Wood county, Ohio. Well said to be doing 3000 barrels a day. Fire at Oil City destroys a small dwelling occupied by E. Buckham. Franklin raises \$1200 for relief of Clarendon sufferers. Reibold pool gauges 5665 from 74 producing wells.

July 9.—Market opened at $60\frac{3}{8}$ c, advanced slowly to $60\frac{7}{8}$ c and closed at $60\frac{3}{4}$ c. Carrying rates, 40c. Washington—McKeown, Martin, No. 4, doing 130 barrels an hour. Gauge of field, 9686 barrels from 189 wells. Chas. Parks, a workman at Bovaird & Seyfang's shops, Bradford, has his leg broken in an altercation with the foreman. Bradford subscribes \$300 for the Clarendon sufferers.

July 10.—Sunday. Richard Winger, aged 16, drowned in the Allegheny River near Siverlyville.

July 11.—Market opened at $60\frac{7}{8}$ c, moved up slowly to $61\frac{1}{8}$ c, fell off and closed at $60\frac{7}{8}$ c. Washington—McKeown, Martin, No. 4, 110 barrels an hour. Campbell, Wade, No. 2, doing 200 barrels a day. G. J. Dort, a rig builder, falls from the derrick of Martin No. 5, at Washington, and is instantly killed.

July 12.—Market opened at $60\frac{3}{4}$ c, advanced to 61c and closed at $60\frac{5}{8}$ c. Washington—Martin No. 4, 103 barrels an hour. Fire destroys considerable property on the Barse tract, near Knapp's Creek, in the Bradford field. Mahoney, the alleged Clarendon incendiary, held for trial under \$3000 bail.

July 13.—Market opened at $60\frac{3}{8}$ c with sales at $60\frac{3}{4}$ c, fell off and closed at $60\frac{1}{8}$ c. Martin No. 4, 105 barrels an hour. Another oil strike reported at Moundsville, W. Va. Fire at the Atlantic Refining Works, Point Breeze, Philadelphia. Several stills destroyed. Engine on the B., R. & P. R. R. explodes near Crawford Junction. Engineer A. L. Eckles killed and Fireman J. M. Wilson seriously injured.

July 14.—Market opened at $60\frac{1}{8}$ c, advanced with many fluctuations to $60\frac{7}{8}$ c and closed at $60\frac{3}{4}$ c. Price of Lima oil reduced to $17\frac{1}{2}$ cents a barrel. Washington—Martin No. 4, 102 barrels an hour. Flack well, Taylorstown, makes its first flow of 26 barrels. Death of Matt Slattery, of Tarport, from sunstroke, at Wapakoneta, Ohio. Coroner's Jury declare that accident on B., R. & P. R. R. was due to a defective boiler and censure the company for its neglect.

July 15.—Market opened at $60\frac{3}{4}$ c, sold down to 60c with quite active trading, dropped off to $59\frac{1}{8}$ c, reacted to $60\frac{1}{8}$ c and closed at $59\frac{7}{8}$ c bid. Carrying rates, $37\frac{1}{2}$ @40c. Washington—Martin No. 4, 100 barrels an hour. Flack farm well, Taylorstown, averages 14 barrels an hour for 28 hours ending this morning. Falsely reported on Exchange floors at 45 barrels an hour. John Firkler

accidentally killed near Four Mile while moving a boiler. A. E. Hill, Vice President of the New York Stock Exchange, drops dead from apoplexy while announcing the death of a fellow member of the Exchange.

July 16.—Market opened at 60c, advanced to 60 $\frac{3}{8}$ c and closed at 60 $\frac{1}{4}$ c. John Denman bids 60 $\frac{3}{8}$ c for 50,000 barrels at Bradford, with no sellers for the full amount. Reibold pool doing 4930 barrels from 75 wells. Washington gauge, 8928 barrels from 190 wells. Flack well, Taylorstown, gauges 300 barrels. Martin No. 4 made 2350 barrels past 24 hours. A 600-barrel still explodes at the Solar refinery, Lima.

July 17.—Sunday. Exceedingly hot. Thermometer 98 in the shade at Bradford. Lightning destroys six wells and six dwelling houses at Cherry Grove. Hugh McElroy, of Karns City, aged 19 years, drowned in the Allegheny River at Brady's Bend.

July 18.—Market opened at 60 $\frac{3}{8}$ c, advanced to 61c and closed at 60 $\frac{3}{8}$ c. Washington—Martin No. 4, 97 barrels an hour. Flack well at Taylorstown down to 185 barrels a day; starts up at 14 barrels an hour when tubed.

July 19.—Market opened at 60 $\frac{1}{2}$ c, broke to 59 $\frac{7}{8}$ c, reacted to 60 $\frac{1}{8}$ c and closed at 59 $\frac{7}{8}$ c. Carrying rates, 35@40c. Kinzua Village—Odell, Smith & Co.'s No. 5 through sand and dry. Washington—Martin No. 4 increased by agitation to 115 barrels an hour for two hours and then drops to 100. Flack well made 258 barrels first 24 hours after being tubed. Weills No. 2 through sand with small showing. Death of Henry R. Lamb, a well-known oil operator of the Lower country and Bradford, at Pittsburgh. John McNerney, of Oil City, in a drunken frenzy murders his wife and shoots his son through the head and is shot by Officer Worden. Great fire at the Standard refinery, Bayonne, N. J.

July 20.—Market opened at 60c, fell off to 59 $\frac{7}{8}$ c, advanced to 60 $\frac{1}{8}$ c, declined to 59 $\frac{5}{8}$ c and closed at 59 $\frac{7}{8}$ c bid. Price of Lima oil reduced to 15 cents a barrel. Washington—Wade No. 4 through Gantz sand and good for 50 barrels a day. Cameron 10 makes 110 barrels in 12 hours. Continued hot weather and great scarcity of water in Bradford and other oil region towns. Bradford B. B. Club plays its last game and is disbanded. Fire at Standard refineries, Bayonne, destroys 10,000 barrels of oil and nearly \$500,000 worth of property. John McNerney, the murderer of his wife and son, dies in the lockup from the pistol shot wound of the police officer. Death of B. F. Innis, a highly respected citizen of Oil City.

July 21.—Market opened at 59 $\frac{7}{8}$ c, moved up to 60 $\frac{1}{8}$ c and closed at 59 $\frac{7}{8}$ c. Premium on Clarendon oil reduced from 15 to 8 cents a barrel.

July 22.—Market opened at 59 $\frac{7}{8}$ c, highest price of the day; sold off and closed at 59 $\frac{1}{4}$ c bid. Carrying rates—Bradford, Oil City and Pittsburgh, 40c; New York, 25c. Washington—Martin No. 4, 103 barrels an hour. Kokomo, Ind., opens up its sixth gas well. Natural gas strike reported at Howell, Mich. Heavy rains augment the water supply and bring cool breezes.

July 23.—Market opened at 59 $\frac{1}{4}$ c, broke to 57c, and closed at 57 $\frac{1}{4}$ c. At Oil City it sold down to 56 $\frac{1}{2}$ c and at Pittsburgh to 56 $\frac{3}{8}$ c. New York closed noon at 57 $\frac{1}{4}$ c. Carrying rates—New York, 15@20c; Oil City, Bradford and Pittsburgh, 40c. Washington gauge, 8969 barrels from 192 wells. Reibold pool gauges 4466 barrels from 75 wells. Phillips well, on the Helm, down and dry. Ohio oil producers hold a meeting at Lima and resolve to demand 25 cents a barrel for their oil.

July 24.—Sunday. Sudden death of Mr. H. W. Davie, of Alton, at a Bradford hotel. Eight car loads of Brad-

ford people leave town on excursion to Charlotte and the Thousand Islands.

July 25.—Market opened at 57 $\frac{1}{4}$ c, advanced to 57 $\frac{3}{8}$ c, declined to 55 $\frac{1}{4}$ c, rallied to 56 $\frac{5}{8}$ c and closed at 56 $\frac{1}{4}$ c. Washington—Martin No. 4, 90 barrels an hour. Willets 20 through sand and doing 60 barrels a day. Wade No. 5 through Gantz sand with no oil.

July 26.—Market opened at 56 $\frac{1}{4}$ c, fell off to 56c, advanced to 56 $\frac{3}{4}$ c, declined and closed at 55 $\frac{7}{8}$ c. Washington—Martin No. 4 has produced 88,950 barrels of oil in 34 days and gauges 95 barrels an hour this morning. Flack well, Taylorstown, is off to 145 barrels a day. Willets 20 shot and starts at 48 barrels an hour.

July 27.—Market opened at 55 $\frac{7}{8}$ c, broke to 55 $\frac{1}{2}$ c, reacted to 55 $\frac{3}{4}$ c, declined to 54 $\frac{7}{8}$ c, advanced to 55 $\frac{3}{8}$ c, sold off to 54 $\frac{1}{8}$ c and closed at 54 $\frac{1}{8}$ c. Washington—Martin No. 4 doing 90 barrels an hour. Wade No. 5 showing oil in the top of the "50-foot." Toledo, Ohio, illuminated by natural gas for the first time, D. W. Jones, of New Brighton, killed, and W. S. Pollock, of Pittsburgh, seriously injured by a collision between two trains on the P. & W. R. R. near Foxburg. Death of Job Moses at Rochester, aged 70 years, who drilled the first oil well in the Bradford field.

July 28.—Market opened at 54 $\frac{1}{4}$ c, weakened to 54 $\frac{1}{8}$ c, advanced to 55 $\frac{1}{2}$ c, and toward the close rallied suddenly to 57 $\frac{3}{4}$ c, fell off to 56 $\frac{1}{2}$ c and closed at 56 $\frac{7}{8}$ c bid. Carrying rates, 35@40c. Washington—Martin No. 4, 90 barrels an hour, Willets No. 20, 160 barrels a day. Fire at Franklin destroys Maloney's restaurant and McBride's liquor store. Loss \$3500. Partially insured.

July 29.—Market opened at 56 $\frac{3}{4}$ c and during first hour declined to 55 $\frac{1}{4}$ c, it reacted to 56 $\frac{3}{8}$ c, fell off to 55 $\frac{3}{8}$ c and closed at 55 $\frac{3}{4}$ c bid. Washington—Martin No. 4, 85 barrels an hour. Willets No. 24, on the Manifold line, strikes a big gas vein in the Gantz sand. Natural gas introduced in Mt. Pleasant, Pa.

July 30.—Market opened at 55 $\frac{3}{4}$ c, weakened to 55 $\frac{3}{8}$ c, rallied steadily till 58 $\frac{1}{4}$ c was reached and closed at 58 $\frac{1}{4}$ c. New York closed at noon at 57 $\frac{1}{4}$ c. Carrying rates—New York, 25c; Oil City, Pittsburgh and Bradford, 35c. Washington production, 8672 barrels from 195 wells. Reibold, 4482 barrels from 78 wells. Phillips No. 6, Behm farm, Reibold, made 233 barrels last 24 hours from the "100-foot" sand. McKeown, Martin, No. 4 made 2040 barrels in 24 hours. Explosion of a still at Clark & Warren's refinery, Corry, causes \$1500 fire loss.

July 31.—Sunday. Two hundred people of Bradford join excursion to Niagara Falls and nine car loads of people go to the Big Bridge. Tank containing 1,000 barrels of oil at the Atlantic refinery, near Philadelphia, struck by lightning and destroyed. Loss \$6000. Heavy storm of wind and rain does much damage to property in Pittsburgh.

THE well drilled for natural gas at Bunker Hill, Miami county, Indiana, 12 miles north of Kokomo, was abandoned July 25 at a depth of 998 feet. When 10 feet in the Trenton a heavy vein of salt water was struck which ruined the prospects for natural gas.

THE well at Martinsville, Indiana, 27 miles southwest of Indianapolis, stopped drilling at 1470 feet, when 83 feet in the Trenton rock. No gas was discovered, but a copious supply of mineral water was struck, for which valuable medicinal qualities are claimed.

THE well on the Niemeyer place, on Knox avenue, Indianapolis, was finally abandoned July 29. The old company failed to sink it to the required depth and a new company, known as the Prospect Street Natural Gas Exploring Co., was organized, which put it down to the Trenton rock, but failed to find any gas.

NATURAL GAS FOR INDIANAPOLIS.

The Capital City Natural Gas Co., after many failures, has succeeded in finding gas within 11 miles of Indianapolis. The first really successful venture is located on the Smart farm, two miles northeast of Lawrence, Marion county, and was struck July 12. When 13 feet in the Trenton rock the pressure was strong enough to raise 4400 pounds of casing several feet. A two-inch pipe from the casing head supplies a constant flame about 25 feet in height. Other wells are to be sunk immediately, and the gas will be piped to Indianapolis by way of Brightwood, where several manufactories are to be supplied. The company controls 3000 acres of land in the neighborhood of Lawrence. The theory is advanced that gas will be found at any point on a line from Greenfield on the extreme east to Noblesville on the north.

The most distant point to which the city will have to go for its gas is Noblesville, 20 miles away, or Greenfield 21 miles. The shortest distance from the city at which gas in considerable quantities has been found is nine miles, at Broad Ripple. The Indianapolis company has a 2,000,000 cubic feet per diem well at Harris' farm, 13 miles away, and now the Capital City company is within 12 miles with a well of large capacity.

The Indianapolis Natural Gas Company completed a good gasser at Fisher's Station, on the Lake Erie & Western R. R., within 15 miles from the centre of Indianapolis, on the 13th of July. The Trenton was struck at 905 feet and the capacity of the well is estimated at 4,000,000 cubic feet per day. The second gasser reached the Trenton rock July 28 at a depth of 872 feet, and at last accounts indications were favorable for a good supply of the gaseous fluid.

The Castleton Natural Gas Co. struck a good gasser at Castleton, 10 or 12 miles northeast of Indianapolis, August 4. It is pronounced by competent judges the best well yet found south of Noblesville.

The Indianapolis *News* says: "The reorganization of the Indianapolis Natural Gas Company has been completed and it is now in a strong financial condition, competent to grapple with the gas problem at whatever expense may be required. A successor to E. B. Martindale, as President, will be chosen in a few days. George Branham, one of the directors, says that the company has been assured that the piping can be done 15 miles in 10 days after the iron pipes have been delivered on the ground."

"The affairs of the company are governed by a regular elected directory, which includes A. M. Fletcher, D. A. Richardson, Fred Ostermeyer, N. S. Byram, M. J. Osgood, George F. Branham and G. R. Root, and among the stockholders are numbered such well-known gentlemen as Frank M. Churchman, Henry Severin, Harry Diehl, Court E. VanCamp, A. B. Gates, E. C. Atkins & Co., Louis Hollweg, A. B. Meyer, W. D. Wiles, A. McCleary, H. B. Ryan, Wm. F. Piel, Nordyke & Marmon, Michael O'Connor, Thomas Madden, W. F. Christian, J. R. Elder, and others that might be named.

"Judge Martindale had what investment he had in the company returned to him, and none of these gentlemen named would lend themselves to any scheme such as is sought to be intimated by those who are believed to have solely the interests of the Standard Oil Co. at heart. The Indianapolis company now has three producing wells, but the supply from these three is not sufficient to supply a pipe line to this city. They are scattered from over one mile to four miles apart, and it would require 50 and more of similar capacity to meet the demand in case a

pipe line should be laid to the city. The company is now drilling within three miles of Noblesville, and it has tried to get territory north and east of Noblesville, but so far it has not been successful, owing to the exorbitant demand of the owners of lands on which it was proposed to sink wells. Representatives of the company have conferred with the Commissioners of Hamilton county, looking to the lease of ground held by the county, and it is possible that some advantageous leases will be made. Wherever the company goes, however, it has to contend against the sinister influence of the Standard Oil monopoly, and within the past few days John J. Cooper, as trustee, and supposed to be representing the Metropolitan company, has been found in the field with a lease very cleverly constructed, for while the word "Metropolitan" is in glaring headlines at the top of the paper, nowhere does the name appear in the body of the lease, and were the caption torn off there would be nothing to signify what company was represented, and the missing fragment would not lessen the legality of the document in question. If there is such a company as the "Metropolitan" in existence it has not been incorporated. Mr. Root says that the Indianapolis company is making no war upon the ordinance as it now exists, but that it is going ahead in an earnest, open way to solve the natural gas question, and if it is possible to obtain a supply, then the company stands ready, if need be, to invest a million dollars in piping the same to this city.

"It comes semi-authoritatively that the Standard Oil Co. desires to make the natural gas rates 20 cents per 1000 feet for Indianapolis, with this in view: The company has demonstrated elsewhere that it can manufacture gas and retail it at this figure at a handsome profit. In case the natural gas should give out, it is said to be the purpose of the Standard in all the cities where it has a monopoly to substitute manufactured (crude) gas and to furnish it at a rate approximating the price which it hopes to inflict on this city."

Kokomo's Sixth Gas Well.

The sixth natural gas well was struck in the Kokomo, Indiana, gas field on the 22d day of July. It enlarges the area of gas territory by several square miles. The well is located on lands leased from Motz & Grether, of Akron, O., and is one mile southeast of the Junction well and on a line due north from the Schrader well. It is owned by the East Kokomo and Akron Natural Gas and Oil Co., and the entire product of the well will be utilized by manufacturers. According to the *Kokomo Dispatch*: "Trenton rock was struck at a depth of 889 feet, and the first vein of gas was tapped July 22, after penetrating the gas-bearing sand three feet. Work was stopped at a total depth of only 909 feet, and 20 feet in Trenton. The flow of gas from this well is about the same as our other wells, excepting the Schrader well. It is as dry as the air of a simoon, and for fear of striking water the owners decided not to go any deeper, although it is the opinion of good judges that the well could be sunk without danger easily 25 feet deeper. The altitude of this well is 14 feet lower than that of the Junction well, which tapped a small vein of blue lick at a depth of 956 feet. The contractors of this well, Messrs. Stewart & Sweeney, made a splendid record in the drilling of it. They started the drill July 2, quit work four days and five nights, *i. e.*, 156 hours, and drilled in at 2 o'clock p. m., the 22d inst., leaving as the actual time of drilling the well about 14 days and nights." A rig for the No. 7 well has been erected on the Byron Reed farm and the drill will be started immediately.

Recent Gas Companies and Their Incorporators.

Knoxville Petroleum and Fuel Co., Knoxville, Tenn. President, R. Z. Roberts; Vice-President, F. J. Leland; Secretary and Treasurer, C. M. Funck.

Somerset Oil and Gas Co., Somerset, Ky. Capital stock, \$250,000. President, W. P. Bentley; Vice-President, Thos. M. Thatcher; Secretary, Geo. W. Sallee; Treasurer, Robert Gilson.

Louisville Natural Gas and Mining Co., Louisville, Ky. Capital stock, \$1,000,000. Incorporators, S. E. English, N. L. Johnson, Charles Warren, Wm. F. Wood and S. H. Garven.

Cimarron Gas, Oil, Water and Mineral Co., Cimarron, Kansas. Capital stock, \$10,000. Directors, Chas. E. Berry, Chas. B. Riley, W. M. Friedly.

Mead Centre Gas, Fuel and Water Co., Mead Centre, Kansas. Capital stock, \$50,000. Incorporators, A. J. Glanirs, C. B. Hamilton, W. G. Emerson and others.

McLean County Natural Gas Co., Bloomington, Ill. Capital stock, \$100,000. Incorporators, R. P. Smith, A. A. Noblitt, R. J. Evans and others.

Hubbard City Oil and Mining Co., Hubbard, Texas. Capital stock, \$250,000. Incorporators, H. B. Allen, David Stern, A. J. Allen, R. Oliver and others.

Council Grove Gas and Mining Co., Council Grove, Kansas. Incorporators, R. W. Carter, W. H. White, F. Lower and others.

North Side Natural Gas and Oil Co., Cincinnati, Ohio. Capital stock, \$20,000. President, Albert Williamson; Vice-President, J. C. Tarrant; Secretary, E. S. Havens; Treasurer, Wm. R. Thompson.

Trenton Rock Natural Gas, Mining and Manufacturing Co., Henderson, Ky. Incorporators, S. H. Lambert, H. C. Dixon, R. C. Roper and Jas. H. Letcher.

Hector Oil and Natural Gas Co., Monroe, Michigan. Capital stock, \$500,000. Incorporators, Chas. D. Saunders, A. K. Detroitter, Franklin Hubbard and others.

Manistee Oil and Gas Co., Manistee, Michigan. Capital stock, \$60,000. Incorporators, John Canfield, Edward Buckley and E. D. Wheeler.

Westeru Natural Gas Co., Mendota, Ill. Capital stock, \$100,000. Incorporators, C. O. Godfrey, M. A. McKay, L. R. Curtis.

Chrisman Oil, Coal and Natural Gas Co., Chrisman, Ill. Incorporators, B. H. Waldruff, J. W. Baum, W. W. Newkirk.

Montgomery Natural Gas Co., Montgomery, Ohio. Directors, N. S. Johnson, H. F. Todd, F. M. Coppock, Thos. H. Foulds, Otto Reich, D. G. Edwards, H. C. Stewart, W. M. Davis, H. G. Steibel.

Denison Natural Gas, Coal and Mining Co., Denison, Texas. Capital stock, \$30,000. President, J. E. Streeper; Vice-President, E. T. Hathaway; Secretary, J. N. Wry; Directors, T. B. Hanna, J. E. Streeper, E. T. Hathaway, A. R. Collins, J. R. Carr, W. A. Tibbs, Geo. Braun.

Winfield Light, Heat and Power Co., Winfield, Kans. President, J. H. Bullen; Secretary, J. S. Mansur; Manager, J. J. Davis.

Shelbyville Natural Gas and Oil Co., Shelbyville, Ind. President, J. C. Aken; Vice-President, J. D. Wilhoite; Secretary and General Manager, R. H. Lewis; Treasurer, S. J. Walling, Jr.

Osborne Coal, Mining and Gas Co., of Osborne, Kans. Capital stock, \$10,000. Incorporators, W. W. Watson, C. W. Baldwin and others.

Kentucky Natural Gas and Mining Co., Louisville, Ky. Capital stock, \$250,000. President, Jas. S. Buchanan; Vice-President, C. H. Shield; Secretary and Treasurer, H. H. Bulitt.

Arkansas City Natural Gas and Coal Co., Arkansas

City, Kansas. Capital stock, \$50,000. Incorporators, A. G. Lowe, J. F. Hoffman, J. L. Huey, Frank Hess and others.

Black River Gas and Fuel Co., Watertown, N. Y. Incorporators, A. D. Remington, Frederick Emerson and others.

Lindsay Natural Gas and Oil Co., Lindsay, Ohio. Incorporators, J. N. Overmeyer, J. E. Boyer, P. N. Overmeyer, Wm. Boyer, W. S. Stevens and C. A. Munck.

McPherson Fuel, Water and Mineral Co., McPherson, Kansas. Capital stock, \$50,000. Incorporators, C. Wheeler, Geo. L. Court, W. L. Bell, E. W. Hulse.

Glasgow Oil, Mining and Natural Gas Co., Glasgow, Ky. Incorporators, C. C. Terry, E. Y. Kilgore and others.

Lincoln Natural Gas and Oil Co., Lincoln, Ill. Incorporators, L. L. Leeds, W. P. Randolph, Hiram Sherman.

Lancaster East End Natural Gas and Oil Co., Lancaster, Ohio. Capital stock, \$5000. Incorporators, Frank Winters, H. B. Peters and others.

Emporia Gas, Oil and Mining Co., Emporia, Kansas. Capital stock, \$25,000. Incorporators, L. E. Perley, H. Parkman, D. S. Clotfelter.

Windfall Natural Gas, Mining and Oil Co., Windfall, Ind. Capital stock, \$25,000. Incorporators, J. H. Zehur, J. D. Baker, John Nutter and others.

Monroe Natural Gas and Oil Co., Monroe, Michigan. Capital stock, \$10,000. Incorporators, Charles Tull, C. W. Beech and others.

Citizens' Natural Gas and Oil Co., Centreville, Ohio. Capital stock, \$20,000. Incorporators, S. W. Cartwright, Jos. P. Smith, I. N. Abernethy, Chas. J. Delaplane, C. E. Gooce.

Swacker Gas, Oil, Coal and Mineral Mining Co., Hutchinson, Kansas. Capital stock, \$16,000. Incorporators, J. W. Swacker, T. T. Taylor, J. F. Sweet, A. Robinson, F. R. Crisman.

Chicago Natural Gas, Fuel and Light Co., Chicago, Ill. Capital stock, \$1,000,000. Incorporators, C. G. Goodwin, J. G. Schurtz, R. A. Wade and others.

Crude Oil for Burning Brick.

A company recently organized at Santa Ana, Cal., is probably the first in the United States to burn brick with crude oil. The company owns four acres, two blocks north of the depot, of first-class land, the depth being 22 feet, at which depth a deposit of potter's clay was found, a sample being taken away by a Sacramento potter to experiment with. The first kiln of 200,000 bricks was an entire success. A kiln of 234,000 is now being burned and two more are to be made, one to contain 222,000 and the other 300,000 bricks. It takes but four days to burn a kiln, using about 1800 gallons of oil to 100,000 bricks, at a cost of five cents per gallon, while it would take 40 cords of wood at \$5 per cord to do the same work. In the yard there are now 124,000 bricks and three gangs of men employed. The crude oil is obtained from the Los Angeles supply Company. It is brought in a huge tank upon a flat car, drawn off in barrels, hauled to the yard and emptied into a tank whence the oil is pumped into another tank, and then forced by a 10-horse power engine through pipes to the kiln. Pipes extend into openings in the kiln about three feet upon each side, through which pours a constant stream of fire which can be regulated at will. Mr. Welch is a brickmaker of 26 years' experience, and he thinks the Oil-burning Brick Company is a success,—*Santa Ana Herald*.

NOTE—A firm of brick manufacturers in Lehigh county, Pa., has been using crude oil for firing its kilns for the past four years with great success.

Crude Market for July.

The oil market remains in a depressed condition, from which all improvement in the statistical situation seems powerless to move it. The production is full 15,000 barrels a day less than one year ago and drilling operations have declined over 50 per cent. The oil producers have perfected a secret organization and are united in their opinion that something must be done to enhance the value of their product. What their plan of action is, is not yet definitely known. The premium above market quotations on Clarendon oil has been reduced from 15 to 8 cents a barrel, and for the Lima product only 15 cents a barrel is paid.

The opening quotations on July 1 were 61½c and 61½c, with an advance the same day to 61¾c, which proved the highest point for the month. For the first 14 days of the month 60c was the bottom figure, but on the 15th the marking down of Lima oil to 17½c a barrel was made the pretext for another raid and Pennsylvania oil was forced below the 60c point for the second time the present year. A reaction set in which culminated at 61½c, and when on the 20th Lima oil suffered another break of 2½c the crude market again entered the fifties. On the 21st it rallied to 61¼c, but there was no strength in the upward movement and prices were forced gradually downward until 54c was touched at Oil City on the 28th. This was the lowest point for the month and the lowest reached since June, 1884. The month closed with 57¼c bid in New York, 58½c in Pittsburgh, and 58¼c at Oil City and Bradford. The New York Exchange closes at noon on Saturday, while the Western Exchanges have made no change in their 3 p. m. closing hour, and this accounts for the difference of the full cent and a quarter in the closing prices of the different Exchanges.

The range of prices for July was 7½c as compared with 3½c in June, 5½c in May, 6¾c in April, 4c in March, 9¾ in February, and 4¾c in January. The average price on the floor of the Bradford Exchange was 59¼c in July, 62½c in June, 64c in May, 64½c in April, 63¼c in March, 63¾c in February and 71c in January. The average price for July one year ago was 66c.

THE CLEARANCES.

	July. Barrels.	June. Barrels.
Bradford Oil Exchange.....	10,808,000	8,536,300
Oil City.....	24,498,000	22,614,000
New York Consolidated Exchange.....	69,788,000	68,410,000
Pittsburgh Petroleum Exchange, est.....	26,810,000	23,068,000
Philadelphia Oil Exchange, est.....	6,597,000	-----
Total.....	138,501,000	122,628,000

Petroleum Fuel for Russian Iron-Clads.

The *Army and Navy Gazette* says: If it is true that the Russian Minister of Marine has decided that liquid fuel is to be used in the furnaces of the Tchesme, an iron-clad of 10,000 tons displacement and protected with 16-inch armor, now building at Sebastopol, we may expect one of the most import questions of the day to be settled ere long. It has long been known that the small craft on the Caspian Sea were being run with liquid fuel, and a ship of considerable size trades, or did very lately, between the Tyne and Odessa, driven by petroleum fires; but our engineers generally have not seen their way to overcome the difficulties that stand in the way of utilizing the enormous advantages that liquid fuel undoubtedly offers. One ton of petroleum properly burned will do the work of at least two tons of coal. Spaces of form and dimensions impracticable for coal can be utilized for its storage. It makes no smoke to speak of and requires no stokers. That it will be the fuel of the future we have little doubt, but whether the difficulties that have hitherto prevented its employment for large engines have now been satisfactorily disposed of is another matter.

The Constitutional Centennial.

LOW RATES TO PHILADELPHIA VIA PENNSYLVANIA ROAD.

The celebration of the one hundredth anniversary of the adoption of the Constitution of the United States, to be held in Philadelphia, September 15, 16 and 17, promises to be one of the most interesting events that ever occurred in this country, and will rank second only to the great Centennial of 1876. The Commission, composed of some of the foremost men in the land, is fully organized, the President of the United States and his Cabinet are in cordial co-operation, and the Governors of all the States are aiding in the execution of the general plan.

A larger number of troops of different States will doubtless participate in the military feature than were ever gathered before on a civic occasion; the industrial display is expected to be the finest and most comprehensive ever seen in this city.

The programme as outlined by the Commission is as follows:

The 15th of September is assigned for a processional industrial display. In the evening of that day the Governor of Pennsylvania will hold a public reception in honor of the Governors of the States and Territories present at the celebration.

The 16th of September is assigned for the military parade and review of the regiments and companies of the militia of the several States and Territories, accompanied by their respective Governors and staffs, and by detachments from the army and navy of the United States, detailed for that occasion. It is also intended, if practicable, to illustrate in this parade the contrast between the military arms and equipments of Revolutionary times and those of the present day. In the evening of the same day will occur a public reception in honor of the President of the United States, with the Governors, representatives of foreign Governments, military, &c.

The 17th of September is devoted to the special services of commemoration, at which the President of the United States will preside. The oration will be pronounced by Mr. Justice Miller, of the Supreme Court of the United States. In addition there will be a poem, national hymns, vocal and instrumental music, &c. Various other entertainments are offered by citizens during the progress of the celebration.

In order to accommodate the vast multitude of people who will desire to witness and participate in this national *fete* in honor of liberty, the Pennsylvania Railroad Company will sell excursion tickets to Philadelphia from all stations on their lines east of Pittsburgh and Erie September 8 to 17, good to return until the 22d, inclusive, at two cents per mile.

Special excursions by special trains from various points will be arranged, the details of which will be published later through the press and other means of public announcement.

Comparative Statement.**STATISTICAL SUMMARY OF THE PETROLEUM SITUATION.**

	1887. July.	1886. July.
Wells completed.....	162	358
New production.....	2,093	10,119
Dry holes.....	35	46
New rigs.....	66	170
Old rigs.....	108	146
Drilling wells.....	143	377
Total field operations.....	317	693
Average daily pipe line runs.....	59,769	74,880
Average daily shipments.....	61,143	71,753
Total stocks custody pipe lines.....	31,549,953	33,060,819

THE MARKET.

	1887. July.	1886. July.
Refined in New York.....	6½	7
Opening price of crude for the month.....	61½	68
Highest price of crude for the month.....	61¾	68¼
Lowest price of crude for the month.....	54	64¾
Closing price of crude for the month.....	58½	65½
Average price of crude for the month.....	59¼	66

The Macksburg Field in July.

The production of the Macksburg field, estimated from the pipe line runs, the shipments of the West Virginia Transportation Company, etc., averaged about 229 barrels a day for 1884. The gross runs of the Macksburg pipe line since January 1, 1885, with the estimated amount of oil shipped from the field through other channels is given below. The averages represent the best obtainable figures on the production of the field:

	Mack-burg P. L. Runs.	Outside Shipments. Est.	Daily Average Production.
1885.			
January	11,894	1500	432
February	20,625	1500	790
March	27,067	1500	922
April	40,527	1500	1400
May	48,258	1500	1605
June	64,982	1500	2216
July	75,737	1500	2492
August	74,228	1500	2443
September	68,110	1500	2320
October	63,619	7000	2278
November	60,926	7000	2264
December	61,113	7000	2197
Total	617,086	34,500	1785
1886.			
January	54,806	7000	1994
February	49,694	7000	2025
March	58,795	8973	2186
April	64,137	7890	2401
May	58,596	6630	2104
June	65,379	2871	2275
July	58,410	4080	2016
August	57,492	2790	1945
September	48,918	1240	1672
October	46,937	3240	1619
November	41,359	4090	1515
December	40,578	3040	1407
Total	645,101	58,844	1682
1887.			
January	37,134	4500	1343
February	28,514	1200	1061
March	32,549	7400	1015
April	29,128	4200	1110
May	24,780	1500	970
June	28,609	3300	1010
July	23,443	3500	880

There were three wells completed in the Macksburg field in July. The well of R. F. Borckman, on the Wagner farm, proved a failure, while Rosser Bros., on the Smith, and Reader & Payne, on the A. Dutton farm, were rewarded with 15-barrel producers. A rig has been erected on the Wickens farm and no wells are drilling in the field. No wells were completed in June and but two in May. On the 31st of the month there were 470 wells in the Macksburg field, 18 of which had stopped flowing, and the average daily production was 880 barrels.

There are two experimental wells under way west of Cambridge, on the line of the B. & O. R. R., about 30 miles northwest of Macksburg. Both are owned by Philadelphia parties.

THE EUREKA DISTRICT.

The Johnson well, on French Creek, was pronounced a failure July 26, and prospects for a new field of any magnitude are very poor. The "burned well," near Eureka, is producing about 4 barrels a day with the tools in the hole. There is only one drilling well and one rig up in the Eureka field. The other two producing wells are making about 5 barrels a day apiece.

The Refined Market.

A good business was transacted in refined during July and the foreign demand was fully up to the average for the season of the year. At the beginning of the month quotations for 70° Abel test were firm at 6½c, but on the 13th there was a reduction to 6¼c, which was followed by another mark down on the 25th to 6¾c. These reductions followed the break in the price of crude, but

had little effect on the foreign markets, which remained unusually firm.

The exports of refined, crude and naphtha, from all ports, from January 1 to July 30 have been as follows:

	1887. Gallons.	1886. Gallons.
From Boston	2,753,500	3,115,505
Philadelphia	87,382,147	84,507,253
Baltimore	5,372,649	9,812,325
Perth Amboy	9,278,499	2,166,920
Total	104,786,695	99,602,003
From New York	208,745,803	222,773,297
Total exports from United States	313,532,498	322,375,300

Refined for the home trade continues in small demand with prices as follow: 8¼@8¾c for New York State legal test, 7@7¼c for 110° test, 7½@7¾c for New York city 110° flash, and 8½@8¾c for New York city 150° water white. Western lots are offered at 6¾@7c for 110° test Standard white, 7@7¼c for 120° test Standard white, 7½@7¾c for 130° test Standard white, and 8¼@8½c for 150° test water white. Western naphtha 68° to 72° test is quoted at 7½@8c delivered in New York.

Refined in cases shows a falling off in the demand. Prices are made up on a basis of 8¾c for plain tops. The clearances for July in this class of goods to China and the East amounts to 852,078 cases, a decrease of 176,349 cases from the same month in 1886. The total clearances to July 30, 1887, are 6,454,606 cases, a decrease of 2,258,313 cases, as compared with the corresponding period of the year preceding.

Mr. George H. Lincoln's monthly circular gives the following figures on the clearances of refined petroleum, in cases, for China and the East up to the 30th of July, for the years 1886 and 1887:

	1887. Cases.	1886. Cases.
China	1,183,685	2,359,007
Japan	1,640,389	1,137,754
India	1,809,717	2,780,026
Java, Singapore, etc.	1,829,815	2,436,132
Total July 31st	6,454,606	8,712,919
Total June 30th	5,602,528	7,684,492
Clearances for July	852,078	1,023,427
Clearances for June	1,084,921	1,471,362
Clearances for May	949,574	1,112,522
Clearances for April	1,085,363	742,478
Clearances for March	1,157,823	2,058,609
Clearances for February	733,626	1,281,488
Clearances for January	591,221	1,018,033
Total	6,454,606	8,712,919

REFINED QUOTATIONS FOR JULY.

	New York	Philadelphia	Baltimore	London and Liverpool	Bremen	Antwerp
	Cts.	Cts.	Cts.	Pence.	Marks.	Francs
1	6½	6½	6½	5½	6.00	15
2	6½	6½	6½	5½	6.00	15
3	6½	6½	6½	5½	6.00	15
4	6½	6½	6½	5½	6.00	15
5	6½	6½	6½	5½	6.00	15
6	6½	6½	6½	5½	6.00	15
7	6½	6½	6½	5½	6.00	15
8	6½	6½	6½	5½	6.00	15
9	6½	6½	6½	5½	6.00	15
10	6½	6½	6½	5½	6.00	15
11	6½	6½	6½	5½	6.00	15
12	6½	6½	6½	5½	6.00	15
13	6½	6½	6½	5½	6.00	15
14	6½	6½	6½	5½	6.00	15
15	6½	6½	6½	5½	6.00	15
16	6½	6½	6½	5½	6.00	15
17	6½	6½	6½	5½	6.00	15
18	6½	6½	6½	5½	6.00	15
19	6½	6½	6½	5½	6.00	14½
20	6½	6½	6½	5½	6.00	14½
21	6½	6½	6½	5½	6.00	15
22	6½	6½	6½	5½	6.00	15
23	6½	6½	6½	5½	6.00	15
24	6½	6½	6½	5½	6.00	15
25	6½	6½	6½	5½	6.00	15
26	6½	6½	6½	5½	6.00	15
27	6½	6½	6½	5½	6.00	15
28	6½	6½	6½	5½	6.00	15
29	6½	6½	6½	5½	6.00	15
30	6½	6½	6½	5½	6.00	15
31	6½	6½	6½	5½	6.00	15

THE PETROLEUM AGE,

DEVOTED TO THE
INTERESTS OF THE PETROLEUM TRADE.

PUBLISHED MONTHLY BY

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LIMA OIL FOR FUEL.

Major Owston, Superintendent of the Fuel Department of the Buckeye Pipe Line, has issued the following circular in regard to the use of Lima oil for fuel purposes:

Inasmuch as the use of oil as a fuel is now engaging the serious attention of many of our principal engineers and manufacturers, we beg leave to submit for your consideration the following advantages which are claimed for oil as against coke, coal or wood as a fuel:

1st. A petroleum fire can be held in perfect control by one man of ordinary intelligence, by the mere turning of a valve. He can increase or decrease the fire at will, and can maintain steam or heat at any desired point. When the fire is properly regulated to produce the heat required, it can be kept at that point with but slight attention, so slight, indeed, that one man can fire and care for a battery of from eight to ten 100 horse-power boilers without difficulty. By turning a valve you can instantly extinguish the fire, if occasion does not require its continuous use, and it can be again started with almost the same rapidity with a few shavings or sticks of wood. There is no waste, as with coal, when the work is done.

2d. The heat generated with petroleum fire is much more uniform than that produced with coal or wood. The fire is not as sensitive to the fluctuation of the weather as other fires. A great advantage is gained in running machinery where regularity of speed is desirable. A constant supply of steam may be furnished, and there is no reduction of steam pressure in consequence of the replenishing of fires.

3d. Economy of Boiler Capacity.—It has been demonstrated that one pound of oil will evaporate the water of more than two pounds of coal. The heat units of crude petroleum have been erroneously stated to be 27,531. The fact is that the correct figure, 29,240 heat units, has been repeatedly arrived at of late, after many tests with the best instruments to be obtained for that purpose. In comparing the calorific properties of petroleum it must be borne in mind that with coal there is an enormous waste of matter, such as sulphur, slate and earthy substances, which are practically incombustible, and which do not add in the generation of heat. While coal theoretically contains about 14,300 heat units, that figure is by reason of these impurities reduced to about 8000. Pure carbon—charcoal, for instance—contains 14,500 heat units. Considering, therefore, the imperceptible waste in the burning of oil, and the excessive waste in the burning of coal, the conclusion is reached that while theoretically the relative proportion of heat evolved in the combustion of oil compared with coal is as 20.2 is to 14.3, the proportion practically considered is in favor of oil as 19 is to 8, or 8.5 at the furthest. We may quite safely assume, then, that the heating capacity of oil is considerably more than twice that of coal as far as now

shown. With a clean boiler, properly attended, and with the best of coal fuel, well stoked, night and day—with every care to insure combustion and to avoid waste, the evaporation obtained in some isolated cases specially recorded has been as high as 9½ pounds. In our everyday experience, however, we find that eighty out of a hundred boilers will not vaporize more than 7 to 7½ pounds of water per pound of fuel. On the other hand, oil tests which, while sufficiently conclusive for the present, have not by any means been carried to the furthest limit, show the vaporization of from 18.24 to 19.5 pounds of water per pound of oil consumed, estimating feed water at from 212° Fahrenheit.

4th. Economy in labor, cleanliness and safety are secured, as in burning oil complete combustion may be obtained. There is no shoveling of ashes, and consequently there is a great saving in labor. The absence of sparks and cinders and the ability to extinguish the fire instantly in case of danger, makes it very desirable when considered with a view to safety.

5th. There being no necessity for opening doors for the introduction of fuel, there is no fluctuation of heat, and no sudden chilling of the flues and boiler. The absence of sulphur in the fuel makes its action on the metal of the boiler and the flues much less destructive than coal, and the flues remain cleaner and in better condition to absorb the heat.

6th. Oil or residuum is without doubt the coming fuel on locomotives and ocean steamers, and by its use a great annoyance to passengers in the emission of cinders and smoke will not only be entirely avoided, but less than one-half the room formerly used for coal will be required to store the oil for fuel, and only one-third the weight will be carried, thus saving a great deal of room in storage, which will enable ship owners to carry an additional quantity of freight, or to increase speed to the same amount of power. Besides this, where 70 stokers are now required to unload coal on ocean steamers, at least 60 could be dispensed with and the work be done without the labor of shoveling coal, and the great discomfort from heat and dust.

7th. Regarding the proper construction of furnaces for the consumption of oil it may be said that there is no occasion for having the combustion chamber as large as when burning coal. The latter article, being solid matter, requires more time for decomposition and the elimination of the products and supporters of combustion. Coal fuel requires a large fire-chamber and the means for the introduction of air beneath the grate-bars to aid combustion. Compared with oil, the combustion of coal is tardy and requires some aid by way of a strong draft. Oil having no ash or refuse, when properly burned, requires much less space for combustion for the reason that, being a liquid and the compound of gasses that are highly inflammable when united in proper proportions, it gives off heat with the utmost rapidity, and at the point of ignition is all ready for consumption. The changes required to burn oil in a coal furnace may be made at a nominal cost, so that even in this respect no additional expense is necessary for a change for the better.

8th. Three barrels of oil, each of 42 gallons, equal and slightly exceed the heating capacity of one ton of coal. The oil weighs 913.5 pounds and may be purchased and delivered in tank cars at any point in the United States at a very low figure. It should be remembered that oil need not be shoveled from the cars to the furnace, it needs no stoking nor poking, it leaves neither cinders nor ashes to be carted away, and it makes no

smoke. With an oil furnace, one man may attend to a dozen boilers without any further assistance.

9th. The fact of being able to produce with oil a perfectly clear white fire, free from ashes, smoke, dust and soot, which can be kept under control and regulated to any degree of heat required, makes its use invaluable in the manufacture of glass, steel, crockery, stoneware, sewer pipe, brick, and in fact almost any business where such a fire is required. This is shown by its having been adopted as fuel by the following manufactories, etc., where it can be seen in operation, and to which we refer:

Faurot's Opera House, Lima Paper Mills and Woolsey & Co., Lima, Ohio; Canton Glass Works, Canton, Ohio; Ohio Paper Mills, Niles, Mich.; Cincinnati Spring Works, Cincinnati, Ohio; Standard Oil Co., Cleveland, Ohio; Consumers' Gas Co. and Chicago Glass Manufacturing Co., Chicago, Ill.; The Defiance Paper Co., Defiance, Ohio; Detroit Steel Spring Works, Detroit, Mich.; Anderson Gas Co., Anderson, Ind.; Beaver Falls Gas Co., Beaver Falls, Pa.; Olemacher Lime Co., Sandusky, Ohio; East End Gas Co., Pittsburgh, Pa.; Atlantic Refining Co., Philadelphia, Pa.; La Bastie Glass Works, Ottawa, Ill.; Bergenport Chemical Co., Baltimore, Md.; Camden Con. Oil Co., Parkersburg, W. Va.; Queens Co. Oil Works, New York; Baltimore United Oil Co., Atlas Refining Co., Negaunee Gas Light Co., Negaunee, Mich.; Solar Refining Co., Lima, Ohio; Calumet Iron and Steel Works, Chicago, Ill., and many others.

In the glass works at Chicago and Canton and the steel works at Detroit and Cincinnati, a much better quality of glass and steel have been manufactured since the adoption of oil as a fuel than when coal was used. In the paper mills at Lima and Niles from 20 to 25 per cent have been added to their product by its use, and in the burning of lime and in the manufacture of illuminating gas the very best results have been secured.

The use of oil as a fuel and heat producer is no longer an experiment. Improved forms of burners and methods of applying are being rapidly introduced, and events in the past few months have demonstrated its entire practicability and economy over the ordinary methods. The cost of adapting it to any furnace or boiler is very small, and owing to its extreme simplicity it can be applied without serious delay or important alterations, and can be changed from burning coal to oil or from oil to coal with very little delay or expense. In addition to the manufactures named above the Calumet Iron and Steel Works of Chicago, the Cleveland Rolling Mill Co., the Britton Iron and Steel Works and many other Cleveland works are using oil as a fuel successfully, and a great number of the largest works of various kinds throughout the country are arranging to introduce it as rapidly as possible.

The Producers New Daily Paper.

The \$5000 required by the Producers' Publishing Co., limited, for erecting a building and equipping the same for publishing a paper was all taken at noon on the 15th of August. The contract for putting up the building was let on the afternoon of the same day to Dennis & Booth, well-known contractors and builders, who will have the building finished within three weeks from the date of taking the contract. A two-story building 45 feet in length by 32 feet in width is being erected on St. James Place. It will be equipped with new machinery and type and will have the facilities for doing job printing. The new paper will be non-partisan in politics and will be run in the interests of the people of the oil country.

The Production of the White Sand Pools.

Since the discovery of the Cherry Grove district in Warren county in 1882, the white sand pools have played an important part in maintaining the world's supply of crude petroleum. While the decline in the older sections of the region has been constant, a sufficient amount of new territory has been opened up every year to prevent a rapid diminution of the surplus stocks that were accumulated during the era of the development of the Bradford and Alleghany fields. The great southwest, that was temporarily abandoned during the exodus to the north that set in between 1879 and 1881, has proved remarkably rich in supplying short-lived but exceedingly fertile pools of small territorial dimensions, and the past year has witnessed a greater number of them brought to light than for any similar period in petroleum history. How many more Reibolds and Washingtons lie hidden in the deep recesses of the earth only the energetic probing of the drill can determine. Washington and Butler counties are still being explored by the ambitious wild-catter, who each month stars his way across the maps in his almost endless search for oil and natural gas.

The following table gives the total production of the principal white sand pools since the discovery of Cherry Grove in 1882. It will be seen that the yield from these sources for 1886 is nearly double what it was in 1885 and nearly three times the production of 1882.

	1882. bbls.	1883. bbls.	1884. bbls.	1885. bbls.	1886. bbls.
Cherry Grove.....	2,345,400	755,512	264,942	135,809	108,876
Cooper	29,864	1,095,558	1,004,849	340,924	201,455
Balltown	2,700	776,244	807,506	348,100	346,312
Wardwell .....	.....	.....	701,226	148,806	.....
Baldrige .....	.....	.....	962,801	1,813,020	708,276
Cogley .....	.....	.....	.....	701,001	1,022,294
Tarkill, 9 months ..	.....	.....	.....	.....	559,564
Pontius, 7 months ..	.....	.....	.....	.....	560,780
Shannopin, 10 mos. .	.....	.....	.....	.....	483,338
Washington .....	.....	.....	.....	10,533	2,418,872
Total	2,377,964	2,627,314	3,741,324	3,498,193	6,409,767
					Total. Barrels.
Cherry Grove.....					3,610,539
Cooper					2,672,650
Balltown					2,280,862
Wardwell					851,032
Baldrige					3,484,097
Cogley					1,723,295
Tarkill					559,564
Pontius					560,780
Shannopin					483,338
Washington					2,429,405
Total					18,654,562

THE Pennsylvania Gas Co.'s main line from the Ludlow gas wells to Corry has a length of 42 miles. They pipe gas over this distance and sell it at Bradford rates for a cooking stove. Mr. John F. Merrill, formerly of the Bradford National Bank, is Auditor of the company. The paid up capital of the company is \$2,000,000.

The Washington Production.

The Washington oil field had produced up to July 31, 1887, a little over 4,000,000 barrels of oil, which sold for about \$3,000,000. The Washington Reporter estimates that 250 wells have been drilled at an expense of \$1,500,000, and that fully \$1,000,000 more have been expended for lands, bonuses, etc. The low price of oil has prevented any large profits to the oil operators, and the greater percentage of profits has been realized by individual producers and one or two large companies. The land owners, of course, have realized the \$1,000,000 bonus and at least one-eighth of the entire production in the way of royalty. Washington, too, has profited by the expenditures of the large amount of money in the way of wages, etc., to drillers, teamsters, laborers and other employes connected with the wells.

July Production Report.

Reports of stocks at wells received by THE PETROLEUM AGE show an average increase of .2 barrels to the well in the Bradford and a decrease of 4.6 barrels to the well in the Allegany field during the month of July. The total number of wells connected with the pipe lines August 1st is estimated at 14,100 in the Bradford and 4000 in the Allegany field. Taking the above figures as the basis of an estimate on the daily production, stocks in tanks at wells were decreased at the rate of 394 barrels a day in the Bradford and Allegany fields. The total daily runs in both fields averaged 25,894 barrels a day in July. Subtracting the reduction in stocks, the Bradford and Allegany production averaged 25,500 barrels a day in July, which may be placed at 4000 barrels a day for the Allegany and 21,500 barrels a day for the Bradford field.

THE JUNE REPORT.

Stocks at wells showed an average decrease of 2.1 barrels to the well in the Bradford and of 4.5 barrels to the well in the Allegany field during the month of June. The total number of wells connected with the pipe lines July 1st was estimated at 14,085 in the Bradford and 4000 in the Allegany field. Taking the above figures as the basis of an estimate on the daily production, stocks in tanks at wells were decreased at the rate of 989 barrels a day in the Bradford and 600 barrels a day in the Allegany field. The total daily pipe line runs in both fields averaged 27,926 barrels a day in June. Subtracting the reduction in stocks, the Bradford and Allegany production averaged 26,337 barrels a day in June, which may be placed at 4,337 barrels a day for the Allegany and 22,000 barrels a day for the Bradford field.

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

Field.	No. Wells July 1.	No. Wells Aug. 1.	Average per well July 1.	Average per well Aug. 1.
Clarendon and Tiona	75	76	19	21
Cherry Grove	22	22	42	35
Cooper District	131	131	27	31
Lower Country	203	204	86	86
Miscellaneous	254	254	68	66

Accepting the outside runs, which are made up of the producing fields outside of Bradford and Allegany, as representing the production outside of those two fields, an estimate on the yield for June and July is as follows:

Field.	July. Barrels.	June. Barrels.
Bradford	21,500	22,000
Allegany	4,000	4,337
Outside Runs	34,505	35,938
Total	60,005	62,275
Macksburg	880	1,010
Total with Macksburg	60,885	63,285
Decrease per diem	2,406	---

This represents a decrease in production of 15,018 barrels per day when compared with the figures for July, 1886.

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region, with the exception of Bradford. The Lima runs by the Buckeye Pipe Lines were 12,580 barrels a day in July, 15,818 barrels in June, 14,486 barrels in May, 11,760 barrels in April, 9777 barrels in March, 7394 barrels in February, 4226 barrels in January, 4374 barrels in December, 4038 barrels in November and 4112 barrels in October.

The following table shows the comparative production for 1884, 1885, 1886 and 1887:

	Bradford.		Allegany.		Outside Runs.		Total Prod.	
	1885.	1884.	1885.	1884.	1885.	1884.	1885.	1884.
January.....	28,675	31,806	8,260	11,264	18,594	16,140	55,529	59,240
February.....	27,051	32,378	7,196	11,607	19,800	18,561	54,047	62,546
March	26,444	31,912	7,342	11,768	19,923	19,764	53,709	63,444
April	27,413	32,442	7,169	11,848	23,067	19,162	57,649	63,452
May	27,231	33,922	7,049	11,547	21,225	19,549	55,505	65,018
June	29,272	33,753	7,463	11,108	21,559	19,977	58,294	64,888
July	30,309	34,031	7,139	11,218	19,273	20,870	56,721	66,119
August	29,858	33,353	7,065	10,384	18,608	22,830	55,531	65,567
September ..	30,205	32,976	7,186	9,877	21,269	22,514	58,660	65,367
October	30,180	31,758	6,747	9,356	23,161	22,762	60,088	63,876
November ..	31,355	31,789	7,002	8,642	23,087	23,557	61,444	63,988
December ..	29,223	29,516	6,196	8,193	24,184	22,918	59,603	60,297
1886. 1885. 1886. 1887. 1885. 1886. 1887. 1886.								
January.....	28,677	28,675	6,378	8,260	22,217	18,594	57,272	55,529
February.....	28,586	27,051	6,651	7,196	22,603	19,800	57,840	54,047
March	27,947	26,444	6,137	7,342	25,680	19,923	53,764	53,709
April	27,807	27,413	6,527	7,169	28,693	23,067	63,027	57,649
May	27,148	27,231	6,535	7,049	34,515	21,225	68,198	55,505
June	27,860	29,272	6,554	7,463	40,040	21,559	74,454	58,294
July	27,046	30,309	6,350	7,139	40,491	19,273	73,887	56,721
August	26,695	29,858	6,200	7,065	43,762	22,830	76,657	55,531
September ..	26,674	30,205	5,994	7,186	45,560	21,269	78,228	58,660
October	25,454	30,180	6,017	6,747	45,538	23,161	77,009	60,088
November ..	24,503	31,355	5,860	7,002	40,817	23,087	71,180	61,444
December ..	22,422	29,223	5,178	6,196	38,783	24,184	66,383	59,603
1887. 1886. 1887. 1886. 1887. 1886. 1887. 1886.								
January.....	23,269	28,677	5,563	6,378	34,254	22,217	63,086	57,273
February.....	22,930	28,586	5,049	6,651	35,745	22,603	63,724	57,840
March	22,327	27,947	4,930	6,137	36,135	25,680	63,392	59,764
April	21,880	27,807	4,447	6,137	37,120	28,693	63,447	63,027
May	21,995	27,148	4,500	6,535	36,758	34,515	63,253	68,198
June	22,000	27,860	4,337	6,554	35,938	40,040	62,275	74,454
July	21,500	27,046	4,000	6,350	34,505	40,491	60,005	73,887

THE PRODUCING REGION.

At the beginning of July there were 67 new rigs and 138 drilling wells in the New York and Pennsylvania oil region, a total of 205. The number of wells completed in July was 162 with an estimated new production of 2093 barrels. The dry holes numbered 35, leaving 127 productive wells, with an average yield of 16½ barrels. In June there were 144 productive wells finished, which averaged 44 barrels each, and the dry holes were 35 in number. The new wells in May averaged 29 barrels, the April 49 barrels, the March wells 42½ barrels, the February wells 65½ barrels, and the January wells 30 barrels each. The July figures show a decrease of 17 wells and of 4287 barrels new production as compared with the figures for June. June revealed an increase over May of 33 wells and 3198 barrels new production. May had a decrease of 23 wells and of 3056 barrels new production, while April recorded an increase of 36 wells and of 2451 barrels in the new production. In July, 1886, there were 358 wells completed, including 46 dry holes, and the new production was 10,119 barrels. At the close of July there were 66 new rigs, 108 old rigs and 143 drilling wells in the entire region, a total of 317 as compared with 67 new rigs, 107 old rigs and 138 drilling wells, a total of 313 at the close of June.

This is a decrease of 1 new rig, and an increase of 5 wells from the figures of June 30, or a net increase of 4 in active operations. June declined 36 from the May report, May 7 from that of April. April had a decrease of 9 in rigs and drilling wells from the March report, while March showed an increase of 7 in active operations over February, February a decrease of 40 from the January report, January a decrease of 48 from December and December of 95 from the November figures. At the close of July, 1886, the record showed 170 new rigs, 146 old rigs and 377 drilling wells, a total of 693.

THE ALLEGANY FIELD.

Only two wells were completed in the Allegany field in July, and both were non-producers of oil. The McQueen & Johnson, on lot 47, Wirt township, was dry, while the National Transit Co. found another gasser on lot 12, Clarksville. Seven wells were completed in June and the same number in May. This field could be no

quieter if a universal shut down prevailed, as only 4 drilling wells were under way at the close of the month.

THE BRADFORD FIELD.

Bradford completed 20 wells in July, with a new production of 179 barrels. The dry hole in the list is a test well drilled southwest of Smethport on warrant 2380. There were 22 wells finished in June and 13 in May. Little interest is manifested in any particular section, and the old production is down to very small proportions. Several old wells have been sunk to a so-called fifth sand, which is claimed to exist in the vicinity of Knapp's Creek, but little if any positive results have been attained. At the close of July there were 8 new rigs and 12 drilling wells in the Bradford field, as compared with 9 new rigs and 16 drilling wells at the close of June.

WARREN AND FOREST.

There were 48 new wells completed in the Middle field in July, including 7 dry holes, and the new production was 333 barrels. This is a decrease of 20 wells and of 840 barrels production as compared with the figures for June. On the last day of July this division of the producing region showed 18 new rigs, 26 old rigs and 37 drilling wells, against 32 new rigs, 17 old rigs and 29 drilling wells on the last day of June.

KINZUA VILLAGE—The latest developments west of the river at Kinzua Village point to a speedy limitation of the area of productive territory. A line of dry holes has been struck directly north and east of the gushers on the Johnson tract and through the very middle of the pool. The Sill, Odell & Smith No. 5, Johnson, one location in advance to the south, was a total failure; No. 6, westerly along the north line of the lot, was an ordinary producer. There is still room for an extension for a little distance to the southwest, but the waning powers of the large wells argue for a petroleum deposit of small capacity and limited area.

Clarendon and Tiona present no new features. There is from 750 to 850 barrels of oil shipped from this district every day to independent refiners which does not appear in the pipe line reports. Cooper and Balltown each completed a single well. None were finished at Kane, while the Grand Valley list numbers but 13. Two wells were drilling at Kane and 5 at Grand Valley at the close of the month. The bulk of the valuable territory at Grand Valley is drilled over, and producers discouraged by a low market are curtailing operations as fast as possible.

ELK COUNTY, ETC.—Three wells were finished in the Elk field in July of the 10-barrel order, and operators there are disposed toward a complete shut down of drilling operations at the close of the present month. Cappeau & Arters finished a dry wildcat in Barnett township, Forest county, south of Marionville, early in the month. The Carnahan well, on the Beaver & Kepler tract, northwest of Tionesta, which started at 60 barrels, has attracted prospectors in that direction, and a large quantity of land has been leased thereabouts.

THE LOWER COUNTRY.

There were 91 wells completed in the Lower country in July, 25 of which failed to find oil; the new production was 1581 barrels, an increase of 10 wells and a decrease of 3413 barrels production from the June figures. On the 31st of July the Lower country had 40 new rigs, 25 old rigs and 90 drilling wells, as compared with 23 new rigs, 36 old rigs and 90 drilling wells on the 30th of June.

VENANGO—The Shamburg region south of Pleasantville, in Venango county, is the most active section of this division of the field. A strip of fairly productive territory has been discovered, which is being prolonged

from the southern border of the old pool in the direction of the old Miller farm on Oil Creek. The wells are less than 1000 feet deep and similar to those found at Grand Valley, in Warren county. The Black Bros., of Pleasantville, are the most extensive operators in the new development and have been rewarded with some excellent wells. Lands have been changing hands at an exorbitant valuation, and the section has enjoyed a degree of animation to which it has long been a stranger. Twelve wells were completed about Shamburg and Pleasantville in July.

The Slab Furnace district did not afford anything very promising in July, although considerable new work was started in the vicinity in the expectation of finding an oil deposit similar to that of Tipperary. A little work of an experimental nature is being prosecuted at various points in the county and the list of operations has been increased, so that the close of July had 22 new rigs and 23 wells drilling, as compared with 13 new rigs and 15 drilling wells at the close of June. Venango completed 40 new wells in July, 9 of which were destitute of oil, an increase of 8 wells over the record for June.

CLARION—It is about as quiet in the oil-producing sections of Clarion county as it is in the localities where farming monopolizes the attention of the inhabitants. Interest in the Reidsburg neighborhood has subsided as the summer months have passed, and a single well was under way there on the first of the month. Lockwood & Co., who drilled one dry hole in the field, were getting ready to toy with the fates again when the monthly count was made. Seven wells were completed in Clarion in July, as compared with 3 in June and 6 wells were drilling July 31, against the same number on June 30.

BUTLER AND ARMSTRONG.

The important wells in the Reibold pool which are to settle the question of a northwestern extension from Phillips & Osborne's No. 3, on the Stewart farm, have not reached the sand at this writing, August 13, but are expected to tap the rock before the close of the month. Their No. 6, on the Stewart farm, which is 400 feet from No. 3 and on a 22-degree line northwest from it, was down 1350 feet on Saturday, August 13. The No. 6, on the Behm farm, a short distance north of the old Lappe failure, on the same farm, is quite a remarkable producer from the 100-foot. It struck a lower pay streak in this rock, and on the 13th of August was producing 500 barrels per day. Johnson & Root's No. 3, on the Blakeley farm, was the largest well finished in the Reibold field during the month of July, and is still producing between 400 and 500 barrels daily. The 78 wells in the Reibold field had a production of 4482 barrels on the 30th of July and 4236 barrels on the 6th of August. On the 13th they were producing 4448 barrels. At the present time there are 10 wells drilling and 2 rigs up and building. A few wildcat wells are drilled every month of the year in Butler county, but all ventures during the past few months have proven unsuccessful to the projectors.

WASHINGTON.

The West Virginia Natural Gas Co.'s well on the Flack farm, at the southwestern end of the Taylorstown development, started at 350 barrels per day, and when first drilled through the sand it gave indications of being the largest well in the field. The gauge which Mr. Tupper makes weekly shows that it lacks the staying qualities of other wells in the field. On the 13th of August its yield was 108 barrels, and the well on the northern part of the Hodgens farm, which started at 180 barrels, had declined to 86 barrels. Hart Bros.' three wells on the Blaney farm are together producing 220 barrels, an don

August 13 the 13 wells in the Taylorstown section had an aggregate yield of 1408 barrels. A number of wild-cat wells are being drilled in advance of developments at the southwestern end of the field. John McKcown's No. 4 well, on the Martin farm, was doing 85 barrels per hour on the morning of the 15th of August. It has remarkable staying qualities and will make this portion of the Washington field the centre of attraction until the wells which are now drilling around it are completed. The wildcatter is busy at various points along the Monongahela River and in other sections of Washington county. I. Willetts & Son are drilling a second well at Vanceville.

Below is a list showing the production of wells by groups on the different farms which make up the total of the Washington field for July 16 and August 13, 1887:

Farm.	Operator.	Number of wells, July 16.	Production July 16, Bbls.	Number of wells, Aug. 13.	Production Aug. 13, Bbls.
Gordon, P. L. & H. Co.		5	127	5	124
Hess,		3	26	3	24
Weirich, Forest Oil Co.		2	61	2	52
Hall,		4	49	4	50
Barre,		13	813	13	652
Taylor, Union Oil Co.		7	207	7	191
Morgan,		8	175	8	165
Davis,		6	393	7	442
Dye,		1	25	1	25
Workman,		3	150	3	140
McGovern,		1	25	1	25
Clark,		1	2	1	2
Zelt & Curry, Associated Producers Co.		2	12	2	12
Wiley & Martin,		2	15	2	13
Gantz & Wiley, Citizens' Oil & Gas Co.		1	18	2	15
Weaver,		1	15	2	12
Clark, Hallam & Co.		1	5	1	5
Taylor, Galligan & Young.		2	30	2	25
Clark, R. H. Thayer & Co.		6	128	6	120
Munee, John McKcown.		12	392	12	393
Martin,		4	347	4	321
Quail,		1	2352	1	2040
Smith, Willets & Young & Chartiers O Co		6	110	6	81
Cameron,		9	308	10	383
Wright, Chartiers O Co & F W Andrews.		3	94	3	77
Fergus, Chartiers Oil Co.		2	233	2	186
Stewart, Fisher Oil Co.		1	17	1	50
Lead Lot, Marsh & Caldwell.		2	36	1	22
" McKeever & Mulholland.		1	1	1	12
Fair Grounds, Wheeling Oil Co.		3	45	3	67
Cradle Factory Lot, Miller.		2	34	2	15
Hall Lot, Guffey & Co.		1	5	1	5
Linn, Coast & Co.		3	50	3	45
Hayes & Weirich, Coast & Co.		2	18	2	18
Shirls, Shirls.		3	20	3	25
Manifold, Pew & Emerson.		2	55	2	53
Gabby,		1	5	1	5
Martin, Central Oil Co.		3	165	4	133
McGahey, Mascot Oil Co.		4	81	4	82
Miller, (Bunghole well), Reid & Co.		1	1	1	1
Montgomery, McKinney & Co. & Robbins.		2	12	2	8
Thome, Chartiers Oil Co & F W Andrews.		1	0	1	5
Wade, B. B. Campbell.		3	205	5	334
Weaver, Hart Bros.		1	15	1	12
Thome, Lee & Shank.		2	37	2	38
Wiley, Munhall & Co.		2	7	2	7
McKean & Van Kirk, Caldwell & Co.		1	0	2	3
Whittlesee,		2	115	2	90
Watson, Butler & Co.		2	16	2	17
Martin, Allen & Co.		1	15	1	14
Munee, I Willets & Son.		23	510	25	610
Montgomery, Montgomery & Co.		1	8	1	6
McNary, Craig & Co.		1	2	1	6
Welsh, Reed & Co.		1	40	1	30
Happer, Happer & Co.		1	8	1	10

TAYLORSTOWN.

J & D McMannis, W Va Nat Gas Co.	2	137	2	140
Noble,	1	166	2	376
Donohy,	1	106	1	101
Carson,	1	6	1	5
Flack,	1	300	1	108
Hodgens,	1	1	1	86
Blayney, Marshall Oil Co.	2	290	3	220
Woodburne, F O Co & Craig.	1	220	1	164
Cundall, Vandergrift, Reed & Aiken.	1	60	1	208
Total	190	8928	201	8710

Date.	No. of wells.	Production Barrels.
July 16, 1887.	190	8928
August 13, 1887.	201	8710
Difference.	11	218

A WYOMING WONDER.

A NATURAL OLEAGINOUS LAKE OF THE BIG HORN BASIN.

THE following remarkable story is told by Mr. Geo. R. Caldwell, editor of the Wind River *Mountain-eer*, who is widely known among his contemporaries of the West as the "Lurid Liar of Landers:"

"From the Bonanza oil district in the No Wood county, Big Horn basin, comes a singular story, which is no less than the discovery of a natural pool of oil inhabited by fish of peculiar and fitting characteristics. The pool is located in the head of a deep and hitherto unexplored gulley just within the confines of the district. It is in the form of a circular rock-ribbed basin, about 100 feet in circumference, and is apparently bottomless. The surface of the pool is one unbroken sheet of nearly pure oil with a depth of six inches. On one side of the pool the rocky rim is broken, and through the orifices thus created the oil pours in small but constant streams to a cavity in the earth, which is apparently as bottomless as the oil pool itself. Thus the oil on the surface of the water is kept at the same uniform thickness, and some idea can be formed of the rapidity of its generation by the contemplation of the unceasing drain to which it is subjected. In the pool itself the water has not yet been fathomed, though a 150 foot rope has been used in the effort to do so. The water immediately beneath the oil surface is rather cool, but rapidly grows warmer as a greater depth is reached. This was noticed and suggested experiments to ascertain the relative heat of the water at different depths. An egg was placed in a small water-tight tin bucket, covered with cold water, and the bucket was then lowered to a depth of 100 feet. It was allowed to remain four minutes, and on being brought to the surface again was found to be in the very eatable condition known as soft boiled. A second egg was then lowered to a depth of 150 feet, and at the lapse of four minutes was hauled up boiled to the last degree of hardness. But the most curious adjunct of this natural oil reservoir is the fish variety there finding a home. These fish move both in oil and fresh water, though they are much fonder of the former than of the latter, and consequently pass by far the greatest part of their existence literally swimming in oil.

The members of this curious piscatorial tribe are long, round and slim in form, greatly resembling an eel in shape, and, as may be readily imagined, even more slippery to handle. They have no means of locomotion but the tail fin. That, however, has been endowed by nature with a flexibility and power amply sufficient to balance all deficiencies, and the oil fish, as the variety has been named, darts about in its native oil with a rapidity approaching the marvelous. The oil fish is readily caught with a hook and line, biting persistently and voraciously at a piece of candle as bait. The oil fish was promptly found unavailable as an article of food, as the agencies of fire and frying pan reduced it to a few tablespoons full of pure oil. It is, however, still caught in considerable numbers for the purpose of evening illumination, it having been ascertained that it makes a fine light. The head of the fish is thrust into a receptacle prepared for the purpose, the wide tail fin is then ignited, and the cabin or dugout of the prospector is aglow with a light as cheap as it is brilliant. The oil fish burns steadily, freely and vigorously down to the very bones of the head. An average fish will last out the evening."

LAKEPORT, Michigan, is seeking for natural gas.

A Western Company to Develop Wyoming Oil Territory.

The representatives of the Northwestern Coal and Oil Company, of Chicago, which is largely interested in the oil and coal lands of Wyoming, met in this city (Milwaukee, Wis.,) with the syndicate of Milwaukee capitalists, who are also largely interested, and a consolidation was effected, so that hereafter there will be but one company. The consolidated company is to have a stock of \$10,000,000 and it owns about 10,000 acres of land in the oil and coal regions of Wyoming, and the deposits of both are said to be exceedingly rich. It has been decided to push the development of the oil region at once, and two wells will be sunk as soon as the machinery can be put in to do the work. The oil lands are located about 125 miles west of Fort Fetterman. The Chicago & Northwestern road is complete to Fort Fetterman and is graded to Casper, 70 miles west of Fetterman, and will be opened to the latter place, it is thought, in September. The Northwestern will then be within 50 miles of the new oil field, and the company has given assurance that the road will be completed into the new district as soon as oil wells are sunk and any freight is provided. Among those who are in the city interested in the oil fields is Geo. L. Aggers, of Denver, who has spent many years in the oil region of Pennsylvania, and is thoroughly versed in the knowledge of oil-bearing formations as well as geology in general, having given them years of study. He has spent considerable time in the Wyoming oil regions, and says that this field is destined without any doubt to eclipse the famous fields of Pennsylvania.

In Pennsylvania the bearing rock is from 15 to 30 feet in thickness, while in this new field it is from 200 to 600 feet in thickness. It will be readily seen that it will take a great many more years to exhaust a well in Wyoming than in Pennsylvania. The rock in this region is just like that at Bradford, Pa., which is the region of the best wells ever found in that State. Wyoming is being rapidly settled. A tide of new-comers is just setting in, and by next spring the boom will be well under way. The Northwestern's new line will cause rapid settlement; it will pass through a great mineral region. The territory has almost every known mineral, and can hardly be excelled for the amount and variety of its deposits.—*Milwaukee Sentinel*.

The Oil City Tube Co.'s Works.

Work is progressing rapidly at the Oil City Tube Co.'s new building, and in the early fall they will begin to furnish pipe to the trade in all sizes up to 12 inches. The building, which covers an area 200 feet in width by 305 in length, is built of and roofed with corrugated iron. The massive machinery to be used is now being placed in position and the steam boilers used in driving the engines which propel it have an aggregate of 500 horse power. Mr. George H. White, a gentleman schooled in all the subtleties of iron and iron-making, has been appointed superintendent. The following are the officers of the company: M. Lowentritt, President; Noah F. Clark, Vice-President; W. J. Young, Treasurer; C. H. Duncan, Secretary; John O'Shea, Manager.

THE total exports of petroleum from America, in gallons, according to a German circular, from January 1 to July 15, for the years 1886 and 1887, have been as follows:

	1887. Gallons.	1886. Gallons.
To Europe.....	205,748,391	191,380,062
To East Indies, etc.....	63,549,924	85,403,870
Total.....	269,298,315	276,783,932

Practical Works on Oil and Gas.

A Practical Treatise on Petroleum, comprising its origin, geology, geographical distribution, history, chemistry, mining, technology, uses and transportation, together with a description of gas wells, the application of gas as fuel, etc. By Benjamin J. Crew. With an appendix on the Product and Exhaustion of the Oil Regions and the Geology of Natural Gas in Pennsylvania and New York, by Charles A. Ashburner, M. S., C. E., Geologist in charge Pennsylvania Survey, Philadelphia. Illustrated by 70 engravings and 2 plates. In one volume, 8vo, 508 pages, price \$4.50. Sent by mail, free of postage, to any address in the world, by THE PETROLEUM AGE, Bradford, Pa.

Natural Gas and Petroleum. Preliminary Report on Petroleum and Inflammable Gas in Ohio. By Professor Edward Orton, State Geologist.

The report answers such questions as these: How were petroleum and gas formed and how accumulated? In what rocks are they contained? Are they forming now?

This is the only volume which treats at length of the new horizon of gas and oil in Ohio and Indiana, viz.: the Trenton Limestone. The conditions under which gas and oil are found in this rock, the districts within which they can be looked for with most promise of success, and the reasons for failure or success in particular districts are pointed out. The most practical modes of measuring the flow of gas wells ever published are described in this volume.

The Preliminary Report of 1886 is reprinted entire, and to it a supplement is added, containing the more recent facts in the new fields.

Maps of the gas-producing belts of Ohio and Indiana as at present developed are added, and also a new map of great interest, showing the topography of the Trenton limestone in Western Ohio and Eastern Indiana.

The volume is timely, and intelligent readers will be sure to avail themselves of this, the first opportunity, to purchase it. It contains about 200 pages. Price, bound in paper, \$1.00; bound in cloth, \$1.25. Sent postpaid to any address on receipt of price. Address THE PETROLEUM AGE, Bradford, Pa.

KOKOMO is to complete two more gas wells before the 1st of September, which will make eight in all, and are expected to swell the output of natural gas to 50,000,000 cubic feet per diem.

J. M. GUFFEY & CO. completed their third gas well at Noblesville, Indiana, on August 11. The company has 20,000 acres leased in this vicinity.

A WELL is drilling on the John Spoor farm, within one and a half miles of Salamanca.

The Average Price of Crude.

The following table gives the average price of crude certificates, on the floor of the Bradford Oil Exchange, since March 1, 1879:

MONTH.	1879	1880	1881	1882	1883	1884	1885	1886	1887
January	-----	110 1-5	95	83	92 3/4	111 1/2	70 3/4	88 3/4	71
February	-----	103 1/4	89 3/4	85 1/4	101	104 1/2	73 3/4	80	63 3/4
March	86	89	82 1/2	80 3/4	97 1/2	100 3/4	80 3/4	77 1/2	63 3/4
April	78 3/4	76 3/4	84 3/4	78 3/4	92 3/4	94	78 3/4	74	64 1/2
May	73 1/2	80 1/4	81 1/2	70	99 3/4	85 1/2	79 3/4	69 3/4	64
June	68 3/4	100 1/4	81	54 1/2	117 1/4	68 3/4	82 1/4	67	62 3/4
July	69 3/4	101 1/4	76 3/4	57 3/4	108	63 1/2	96 3/4	66	59 3/4
August	67 3/4	90 3/4	78 3/4	58 3/4	108 3/4	81 1-5	100 3/4	62	-----
September	69 3/4	95 1/2	92 1/4	71 1/2	112 1/2	78	100 3/4	63 3/4	-----
October	88 3/4	96 3/4	92 3/4	93 3/4	111 1/2	71	105 1/2	65 1/2	-----
November	105 1/2	91 1/2	82 1/2	114 3/4	114 4-5	72 1/2	104 3/4	72	-----
December	113 3/4	92 3/4	83 3/4	95 3/4	114 3/4	74 3/4	89 3/4	71	-----

NATURAL GAS IN PITTSBURGH.

THE PHILADELPHIA COMPANY.

The statement made by the Treasurer of the Philadelphia Company, August 11, shows a gratifying state of affairs. The capital stock of the company will be increased to \$7,500,000 by allowing present stockholders to subscribe for 14,908 additional shares. During the nine months from October 1, 1886, to July 1, 1887, the assets have been increased \$318,487.90, while the indebtedness has been decreased \$1,680,343.92. The company now controls 66,318 acres of gas territory and owns 86 producing wells. It is delivering more gas than at any time in its existence, and has a surplus supply more than equal any immediate demands. The subscription to the shares now offered for sale will be more than sufficient to wipe out the entire indebtedness of the company.

THE PEOPLE'S NATURAL GAS CO.

The Baden Natural Gas Co. will lay a new line from its wells in the Glenfield district to Allegheny, for the purpose of giving the People's Natural Gas and Pipeage Co. an additional supply for the coming winter. The line will be laid telescopic fashion—little at one end and big at the other. The first two miles from Glenfield will be laid with 10-inch pipe, the next three miles with 12 inch and the last four miles nearest Allegheny City with 16-inch.

The People's Pipeage Co., which supplies dwelling houses in eight wards of Allegheny City with gas, has found the demand for the coming winter such as to necessitate the laying of the new line, as it is thought the present 10 inch main will not be sufficient. The new line, being 16 inches in diameter at the Allegheny end, will hold a much larger volume of gas than the old one. These lines will be the only ones coming into Allegheny which do not cross one of the rivers and are free from liability to inundations or washouts. The pipeage company has laid 22 miles of low-pressure lines within the past year and will have 30 miles laid before fall. It is also preparing to lay a new river line from near Lindsay & McCutcheon's mills across the Ohio to Sawmill run to connect with the mains of the Washington Natural Gas Co., with which the Pipeage company has a contract. The present river line, which has sprung a leak, will be raised and relaid as soon as the new one is completed. In case the Washington and Royal companies consolidate, the pipeage company will be able to get a much heavier supply from the Washington county field than at present. It is estimated that the 13 wells now finished in the Baden, Economy and Glenfield districts, from which the pipeage company gets its supply, will produce 102,500,000 cubic feet of gas daily. This is equivalent to about 102,500 bushels or 3940 tons of coal, which would require 265 cars of 15 tons each. The Baden company has 6800 acres of land leased, and their wells are located along the Ohio River, between Glenfield and Baden, and directly on the main gas line.—*Commercial-Gazette*.

THE ROYAL AND WASHINGTON COMPANIES.

The preliminary steps looking to the consolidation of the Washington Gas Co., of Pittsburgh, and the Royal Natural Gas Co., a corporation owned and operated by Philadelphia capitalists, have about been completed. The Royal Natural Gas Co. has just secured a new charter preparatory to the consolidation, and the new concern will operate under that name. The Royal company has some of the wealthiest stockholders of any gas corporation in the country, the Philadelphia company not excepted. Among them are Drexel & Morgan, of Philadelphia; J. Lober Welsh, of Philadelphia, a director

of the Reading Railroad, and C. D. Robbins, the well-known oil and gas operator of Washington, Pa. The Board of Directors of the company consists of Messrs. Beauveau Borie, banker; J. Lowber Welsh, John S. Newbold, banker; Richard S. Brock and W. P. Logan, all of Philadelphia, who own a large part of the stock, \$700,000, while the chief stockholders of the \$500,000 capitalization of the Washington Gas Co. are Capt. J. B. Ford, Wm. Nelson and Congressman Sam Barr, of Harrisburg. The Royal has a monopoly of the natural gas business in Steubenville, and makes a round profit, while the Washington markets its fuel in Pittsburgh and pays dividends of 1 per cent. a month, having been the first corporation of the class to declare a dividend. Its gas territory is in the Hickory district of the Washington county field, owning in fee simple the old McGuigan well and the land immediately surrounding it, and in addition has the right to drill 20 wells on the leases of the old Niagara Oil Co., now owned by the Chartiers Valley Gas Co. The Royal's territory is also in Washington county, and it has a large block of it, all of the best quality. By uniting the two companies the Royal secures an entrance into Pittsburg, and it is understood that as soon as the necessary formalities have been gone through with the capital stock will be increased to \$2,500,000, and work commenced on a new large line from the Hickory district to Pittsburgh.

The Producers' Meetings.

Early the present month several important meetings of oil producers were held at Bradford with a view of obtaining some relief from the depressing state of affairs that has prevailed so long in the oil regions. The first meeting, held August 1, in the parlors of the St. James Hotel, was called at the invitation of Mr. H. L. Taylor, President of the Union Oil Co., and was attended mainly by the heavy men in the trade. The following were present: H. L. Taylor, Buffalo, President Union Oil Co.; W. J. Young, Oil City, General Manager Forest Oil Co.; Col. J. J. Carter, John L. McKinney, J. C. McKinney, Titusville; N. F. Clark, M. Lowentritt, T. B. Simpson, Oil City; Henry Fisher, Pittsburgh; George Van Vleck, Buffalo; Thomas W. Phillips, Butler; Capt. J. T. Jones, Major A. C. Hawkins, T. P. Thompson, C. S. Whitney and S. F. Wheeler, Bradford.

After an informal discussion of the situation and interchange of views, the following resolution was adopted:

WHEREAS, The organization of producers forming throughout the oil country are so nearly ready to formulate a plan looking to the end for which we strive, we deem it best to defer action until said plan is presented; therefore be it

Resolved, That we adjourn to meet at the call of H. L. Taylor, and will do all in our power to either join that organization or co-operate in any feasible plan to better our condition as producers of petroleum.

On the following day, August 2, about 25 Assemblies of the Producers' Protective Association were represented at a meeting in the Assembly-room of the Producers' Exchange. The session lasted two days, and its proceedings were not made public.

THE well at Vernon, Indiana, was 50 feet in the Trenton rock August 12. No gas was found in this formation, but a considerable quantity was found in the Niagara shale.

A GOOD gas strike was reported August 9 at Jefferson, ville, Indiana.

JULY OPERATIONS.

THE ENTIRE REGION—WELLS COMPLETED, WELLS DRILLING, AND RIGS UP AND BUILDING.

WELLS COMPLETED IN JULY, 1887.

Allegheny Field.

Twp.	Owner.	Barrels.
Wirt, 47,	McQueen & Johnston No 3	dry
Clarksville, 12,	National Transit Co No 87	gas
Wells completed		2
Production		0
Dry		2

Bradford Field.

East and West Branches.

2268, R. J. Straight No 24	6
Bingham, Van Vleck & Mitchell No 44	10
Rutherford, J T Jones No 47	10
" " No 48	10
" " No 49	10
" " No 50	10
Clark, Clark & Owens No 5	8

Kendall Creek.

Melyin, P C L & P Co No 101	10
" " No 102	10
" " No 103	10
" " No 104	10

Knapp's Creek.

White, Mitchell & Jones No 82	8
Ellis, Dr Chrisman	3

Foster Brook.

C B & H, Watson Oil Co No 51	6
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Indian Creek.

W & M, McKinney Bros No 10	10
Gale, G N Moore No 14	6
" Barden, Cook & Dodd No 3	6

Cole Creek.

Bingham, lot 583, Associated Producers No 68	25
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Kinza.

Wood's lease, Stewart & Co No 5	6
Lot 128, P T & W C Kennedy No 7	5

Miscellaneous.

Warrant 2380, F. W. Andrews	dry
Wells completed	21
Production	179
Dry	1

Warren and Forest.

GLADE AND OTHER TOWNS.

Kinza Village.

Johnson, Smith, Sill & Odell No 5	dry
" " " No 6	25
Hodge, Collins & Co No 5	25
" " " No 6	25
" " " No 7	10
White, Smith, Bright & Co No 11	dry
" " " No 12	dry
" McCalmont & Morse No 10	8
Sherman Island, Cheney & Co	dry
Fogel Island, Collins & Merrill	dry
Wells completed	10
Production	78
Dry	5

Clarendon.

35, Henderson & Murphy No 13	6
35, D McKelvy & Co No 5	6
105, Hackett & Shirley No 9	5
465, Fred Hue No 7	5

463, D. Riddlesperger	5
464, Columbia Oil Co No 26	5
465, Lockwood & Parsons No 18	5
Stonehill, Nutting & Co No 7	4
532, C A & D Cornen No 3	5
562, Goal Bros No 5	5
Wells completed	10
Production	51
Dry	0

Tiona.

82, J L McKinney & Co No 17	8
110, " " No 7	5
159, " " No 4	6
159, " " No 8	5
" " " "	5
" " " "	5
324, W W Winger No 3	5
232, Pennsylvania Gas Co No 14	gas
Wells completed	8
Production	39
Dry	1

Cooper.

Syndicate, Anchor Oil Co No 19	10
Wells completed	1
Production	10
Dry	0

Balltown.

Green, J C Welsh	8
Wells completed	1
Production	8
Dry	0

Grand Valley.

Zane, National Oil Co No 16	10
Peterson, Miller & Crippen	5
" " " "	12
Gibbs, L B Wood & Co	6
Knapp, " " "	5
Leckey, " " No 9	4
Fisher, " " "	2
Lot 149, G P Kepler & Co	10
Lot 138, " " "	3
Lot 150, Fertig & Bartlett	6
Proper, Bovee & Duck No 4	8
Enterprise, Matson & Coldren	3
Breen, John Breen	3
Wells completed	13
Production	77
Dry	0

Miscellaneous—Elk County, Etc.

2032, Porter, Thyng & Co No 7	10
2032, Boggs, Rosenberg & Co No 3	10
2033, Clark & Foster No 7	10
Burnett twp, Cappeau & Arters	dry
Kepler, (Tionesta) Carnahan Bros	20
Wells completed	5
Production	50
Dry	1

Lower Country.

Venango and Other Sections.

Farm.	Operator.	Barrels.
Kirkwood, Kirkwood & Co		15
McClintock, McComb Bros		6
Buchanan, Rouseville Oil Co		3
Columbia, Columbia Oil Co No 175		2
Niagara, Henry Wilbur		5
Pioneer, (McElheny) Pres McCray		5
Tract 47, J J Fisher No 10		5
Lloyd, Reno Oil Co No 4		5
Walnut Bend, Taylor & Terrey		dry
McKinney, Trax & Simmons		dry
Cranberry, Shaffer & Milton		6
Scrubgrass, (Atwell) Hassan & Co		dry
East Sandy, Bartlett & Kugler		dry

Vicinity Pleasantville.

Talman, Black Bros No 3	15
" " " No 4	12
Daily, " " No 1	10
" " " No 2	20
Fleming, " " No 3	10
Tallman, Alshouse & Co	3
Poor, Joy & Co	3
Atkinson, Ward & Hammond No 2	5
Fisher, Palmer & Saurey	10
Wege, Wege & Co	2
Chandler, Siggins & Co No 4	5
Atkinson, Culp & Stewart No 1	6
Tipperary, Hall's Run, Etc.	
Burns, Deitrich & Warfield No 3	5
Brough, Dufur & Co	dry
" Mitchell & Steele	dry
Grant, Kelley & Smullin	5

Rockland or Red Valley.

J. Hetzler, Dale Bros	5
Shavers, Dale & Miller No 3	5

Mt. Hope and Smoky District.

P. Stroup, Sheasley & Galbraith No 1	8
Hancock, " " No 2	5
Malett, Lee & Co	dry
Dale, H M Dale	3

Bullion.

Crawford, Hoffman & Co	dry
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Vicinity Emlenton.

J W Smith, Riverside Oil Co No 8	6
Albeck, Crawford & Co	5
Weaver, W T Crawford	dry
Flynn, Flynn Bros	6
Wells completed	40
Production	200
Dry	9

Clarion.

Black, Berlin & Sons	8
Montgomery, Montgomery	5
Wagner, Hahn & Wagner	4
Shippin, John J Carter No 8	15
Cotterman, Weaver & Co	3
Near Foxburg, Simpson, Kerr & Co (est)	5
West Freedom, McGraw & Co	dry
Wells completed	7
Production	40
Dry	1

Butler and Armstrong.

Washington twp, Armstrong & Co	dry
Gelbach, T W Phillips & D Osborne No 5	25
" " " No 6	7
Stewart, " " " No 5	dry
Dickey heirs, " " " No 1	30
D Markle, " " " No 3	35
Behm, " " " No 6	200
Helm, " " " No 1	dry
Peiffer, Marshall Oil Co No 1	5
Blakeley, Leidecker Bros No 6	25
" " Johnson & Root No 3	500
Behm, Burchfield & Co No 3	5
Duncan, McKelvey & Co No 1	dry
Peiffer, McTamany, Greenlee & Co No 2	dry
Rev Hickey, Brushwood Oil Co No 7	10
McClymons, Standard Plate Glass Co	gas
McCue, Brady & Miller	3
Coyle, Fisher Oil Co No 2	dry
Ball, P C L & P Co No 2	12
Saxonburg, (Smalley) Iman, McBride & Co	dry
Frederick, Brady & Simpson No 3	10
Kepples Corners, Mortimer & Co	6
Black, Garret & Gray	3
Jacob Frederick, Shenango Gas Co	gas
Hewins, " " "	gas
Herman Station, Nat Transit Co	gas
Graft, Queen & Guffey	dry
Wexford, Shetler & McKelvey	dry
Peiffer, Reep & Sutton	dry
L Witt, Lawrence Witt	7
Linneberg, Seibert & Co	dry
McElwee, Burns, McMarlin & Taylor	6
Mooney, Hunter & Co	dry
Forringer, Herbert & Co	dry

Martinsburg.

Shakely, Asa Byers	dry
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Thorn Creek.

Bulford, Iman, Golden & Co	25
Burton, Collins & Co No 2	15
" " Greenlee & Co No 2	12
Dixon, Weible Bros & Co	10
Andrews, Muller, Kimmel & Co (est)	15
Wells completed	36
Production	966
Dry	14

Washington.

Cameron, Willets, Young & Chartiers Oil Co No 10 (est)	50
Munce, Willets & Son No 20	50
" " " No 24	gas
Wiles, C O & G Co No 2	10
Wade, B B Campbell No 4	55
" " " No 5	60

Taylorstown.

Flack, West Virginia Natural Gas Co No 1	125
Wells completed	7
Production	350
Dry	1

Shannopin.

McCoy, Reed, Davidson & Co	25
Wells completed	1
Production	25
Dry	0

DRILLING WELLS.

RIGS UP AND BUILDING JULY
31, 1887.

Allegheny Field.

Lot.	Owner.	Depth.
3,	Coyle & Simon (old)	rig
12,	Allen & Morse (old)	rig
12,	Griffin & Co No 10 (old)	rig
50,	Pease & Coyle No 9 (old)	rig
46,	L. G. Norton No 4 (old)	rig
New rigs		0
Old rigs		5
Drilling		0
Total		5

Alma.

3,	M J McMullan & Co No 5 (old)	rig
23,	Vance & Horton (old)	rig
26,	Willets & Elliott (old)	rig
51,	Sawyer & Co (old)	rig
120,	McCalmont Oil Co No 10 (old)	rig
New rigs		0
Old rigs		5
Drilling		0
Total		5

Wirt.

52,	(Jacob Jordan) Wilson & Johnston No 9 (old)	rig
55,	(Orson Witter) P M Shannon & Co No 1 (old)	rig
61,	(J Jordan) Ackerly, Barton & Co (old)	rig
61,	(Isalah Jordan) Lester, Jordan & Co No 6 (old)	rig
61,	" " No 7 (old)	rig
62,	(Peterson) Limekiln Club No 4 (old)	rig
62,	(Latham) " No 1 (old)	rig
47,	J W Weeks (old)	drilling
60,	Rollin Dow	drilling
New rigs		0
Old rigs		8
Drilling		1
Total		9

Bolivar.

12,	Wood & Co (old)	rig
23,	F C Streeter & Co No 12 (old)	rig
New rigs		0
Old rigs		2
Drilling		0
Total		2

Genesee.

14,	Merwin (old)	rig
22,	I Willets No 14 (old)	rig
22,	" No 15 (old)	rig
22,	" No 16 (old)	rig
22,	" No 17 (old)	rig
22,	" No 18 (old)	rig
23,	Coughlin (old)	rig
29,	William Cranston (old)	rig
8,	I Willets	drilling
24,	Wheeler & Dusenberry	drilling
New rigs		0
Old rigs		8
Drilling		2
Total		10

Clarksville.

3,	(Jordan) Angell Oil Co No 5	drilling
5,	Lane, Lane Oil Co No 7 (old)	rig
6,	(Seever) Ackerly, Barton & Co No 9 (old)	rig
9,	Heuston & Brecht No 4 (old)	rig
9,	Merritt (old)	rig
10,	(Smith) Fritz & McKelvy (shut down)	500
5,	(Weatherbee) Barton & Ackerly (old)	rig
New rigs		0
Old rigs		6
Drilling		1
Total		7

Bradford Field.**East and West Branches.**

2263, R J Straight No 25	drilling
Rutherford, J T Jones No 51	1000
" " No 52	300
" " No 53	rig
Mack, Columbia Oil Co (old)	rig
Mack, Fisher Oil Co No 19 (old)	rig
Paton, McClure & Co (old)	rig
Clark, McCray Bros (old)	rig

Quintuple.

25, O H Strong (old).....	rig
44, J W Humphrey (old).....	rig
260, E T Howes (old).....	rig
<hr/>	
New rigs.....	1
Old rigs and shut down.....	7
Drilling.....	3
<hr/>	
Total.....	11

Kendall Creek.

Melvin, P C L & P Co	No 105	500
" "	No 106	400
" "	No 107	300
" "	No 108	rig
" "	No 109	rig
" "	No 110	rig bldg
		<hr/>
New rigs		3
Old rigs		0
Drilling		3
		<hr/>
Total		6

Knapp's Creek.

Matthews, C B Whitehead No 6 (old)	rig
Borden, T P Thompson (old)-----	2 rigs
<hr/>	
New rigs-----	0
Old rigs-----	3
Drilling-----	0
<hr/>	
Total-----	3

Foster Brook.

E T Co, Kervin & Co No 10 (old).....	rig
No 11.....	rig
C B & H, Juter & Yager (old).....	rig
" Clark, Cooper & Co No 9.....	500
" Burns & Monroe (old).....	rig
" Watson Oil Co No 52.....	drilling
" No 53.....	rig
<hr/>	
New rigs.....	2
Old rigs.....	3
Drilling.....	2
<hr/>	
Total	7

Four Mile.

Van Campen, Coldren & Vance (old)	rig
" Jas K Van Campen No 3	

Indian Creek.

Hamlin, M B Squiers No 4 (old).....	rig
Gale, Barden, Cook & Dodd No 4.....	rig
W & M, McKinney Bros No —.....	drilling
<hr/>	
New rigs.....	1
Old rigs.....	1
Drilling.....	1
<hr/>	
Total.....	3

Cole Creek.

Warrant 2263, Union Oil Co No 6(old)	rig
" 2263, " No 7(old)	rig
Bingham, lot 469, Bennett & Thompson No 11 (old)....	rig
" lot 477, Tucker & Rolfe No 3 (old)....	rig
" lot —, C P Byron No 14 (old)....	rig
<hr/>	
New rigs	0
Old rigs	5
Drilling	0
<hr/>	
Total	5

Kinzua.

Guffy & Hulings, Union Oil Co No 73	(old).....	rig
Lot 128, Newell & Quigley	No 4.....	drilling
" 128, "	No 5.....	rig
		<hr/>
New rigs.....	1	
Old rigs and shut down.....	1	
Drilling.....	1	
		<hr/>
Total	3	

Miscellaneous.

Port Allegheny, Arnold, Dolley & Co	(for gas)....	drilling
New rigs.....	0	
Old rigs.....	0	
Drilling.....	1	
Total.....	1	

Warren and Forest.**GLADE AND OTHER TOWNS.****Kinzua Village.**

Hodge, Morse estate No 8.....	drilling
Weed, " No 12.....	drilling
" " No 13.....	drilling
White, McCalmont & Morse No 11..	sand
" " No 12.....	rig bldg
5563, Smith, Bright & Co No 13.....	drilling
Glade twp, (Gardner) Joe Magee & Co.....	rig
Irvinton, Warren company.....	drilling
Cornplanter Run, Brown Bros & Nesmythe....	sand
<hr/>	
New rigs.....	2
Old rigs.....	0
Drilling.....	7
<hr/>	
Total	9

Clarendon.

35, D McKelvy & Co No 6.....	drilling
105, Hackett & Shirley No 1.....	drilling
105, Tucker & Co (old).....	rig
162, J A Dower (old).....	rig
Stone Hill, Nutting & Co No 8.....	drilling
465, Fred Hue No 15.....	drilling
532, C A & D Cornen No 4.....	drilling
532, " No 5.....	rig
532, " No 6.....	rig bldg
585, H Simpson & Co.....	rig
556, J A Waterhouse & Co No 25 old	rig
556, " No 26 old	rig
556, " No 27 old	rig
562, Goal Bros No 6.....	rig
<hr/>	
New rigs.....	4
Old rigs.....	5
Drilling.....	5
<hr/>	
Total.....	14

Tiona.

17, J L McKinney & Co.	drilling
140, " "	drilling
163, Helm & Mealy	drilling
232, Penna Gas Co (for gas)....	3 rigs
284, Watson & Mitchell No 8 (old)....	drilling
319, (Sheffield) Horton, Crary & Co (shut down)....	rig
	sand
<hr/>	
New rigs	3
Old rigs	2
Drilling	5
Total	10

Cooper District.

407, Shank & Stewart No 9 (old).....	rig
407, " " No 13 (old).....	rig
<hr/>	
New rigs.....	0
Old rigs.....	2
Drilling.....	0
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Total	2

Balltown.

3194, Porcupine Oil Co No 39 (old).....	rig
3195, (Crisman) N F Clark No 14(old).....	rig
3195, Proper Reserve Oil Co.....	600
	<hr/>
New rigs.....	0
Old rigs.....	2
Drilling.....	1
	<hr/>
Total.....	3

Kane.

343, (Looker) Ernout & Co No 3..	drilling
Kane, (Griffith lot) Blood & Co (for gas).....	drilling
344, Treat & Mallory No 8 (old)....	rig
420, Coast & Sons No 24 (old).....	rig
3767, Union Oil Co (old).....	rig

New rigs.....	0
Old rigs.....	3
Drilling.....	2
Total.....	5

Grand Valley.

Phil lands, Crippens & Phillips No 6 (old).....	rig
Campbell, National Oil Co No 18 (old).....	rig
" " No 19 (old).....	rig
" " No 20.....	rig
Zane, " No 17.....	drilling
Hunter, " No 18.....	rig bldg
" " No 11 (old).....	rig
" " No 12 (old).....	rig
" " No 13 (old).....	rig
Emerson, L B Wood & Co.....	sand
Huidekooper, ".....	rig
Lot 150, Nelson, Farrell No 14 (old)....	rig
" 150, " No 15 (old)....	rig
" 137, G P Kepler & Co (old).....	rig
" 136, " No 3 (old).....	rig
" 135, (B & R tract) D Emery & Co.....	rig
" 142, Holman & Hopkins.....	rig
" 238, J B Jennings & Grandin (old).....	rig
Proper, Bovee & Duck No 5.....	drilling
" " No 6.....	rig
McIntyre, Dunn & Co.....	sand
Chapple Hill, Grand Valley Gas Co.....	drilling
Enterprise, J P Cappeau & Co.....	rig
Henderson, City Oil Co.....	rig

New rigs.....	8
Old rigs.....	11
Drilling.....	5
Total.....	24

Miscellaneous—Elk County, Etc.

Collins, Syndicate No 1.....	sand
1799, sub 2, Gillis Farm Oil Co., No 1.....	1500
2032, Boggs, Rosenberg & Co No 4.....	drilling
2027, Armstrong & Boggs, No 1.....	drilling
2676, Wilcox Tannery Co.....	drilling
Rolfe, ".....	drilling
2025, Clark & Foster No 1.....	drilling
2033, " No 8.....	drilling
3664, " No 5 (old).....	rig
2033, Porter, Thyng & Co No 10.....	drilling
2686, Armstrong & Co.....	rig
2033, Highland Oil Co No 3.....	drilling
Crawford, Sill & O'Dell No 2.....	drilling
Millstone twp, Welsh & Wallace.....	drilling

New rigs.....	1
Old rigs.....	1
Drilling.....	12
Total.....	14

Lower Country.*Venango and Other Sections.*

Allegheny Bank lands, Oil City Fuel Supply Co (old).....	rig
McBride, Thomas Smith (old).....	rig
Osmer, Galbraith & Parker (old).....	rig
Rynd, Wratten & Co (old).....	rig
Columbia, Columbia Oil Co No 176.....	rig
Niagara, H Wilbur.....	sand
Kirkwood, Kirkwood & Co.....	drilling
Buchanan, Rouseville Oil Co.....	drilling
" J H McCandless.....	rig
Geo Wratten, Curtis.....	rig
W P McCray, McCray.....	rig
Pioneer, (Keech) J Stillwagon (old).....	rig
Pithole, (Blank) Duke & App'ebec (old).....	rig
Kaufman, Judd & Geizer.....	drilling
Walnut Bend, Trax & Simmons.....	drilling
" J H Oberly.....	drilling
Haggerty, Ritts & Co.....	drilling

Vicinity Pleasantville.

Landas, W P Black (old).....	rig
Talman, " No 5.....	drilling
" " No 6.....	rig
" " No 7.....	rig
Dailey, " No 3.....	rig bldg
Tarr, " No 1.....	rig bldg
Poor, Joy & Co No 2.....	drilling
" " No 3.....	rig bldg

Alkarn, McKinney & Co.....	rig bldg
Tarr, Wilhelm & Kearney No 4.....	drilling
Shreve, Dr Shamburg.....	rig
Dawson, White & Kraeffert.....	sand
Aukerhauer, Wilson Bros.....	rig bldg
A W Brown, Black Bros.....	rig bldg
Jordan, Culp & Stewart.....	rig bldg

Tipperary, Hall's Run, Etc.

Moore, Beers & Co No 3 (abandoned).....	750
" Speechley (old).....	rig
Humboldt, Taylor, Torrey & Murphy No 1.....	drilling
Phil & Bost, Gates & Doty.....	rig
" Goodrich & Salisbury.....	rig bldg
Mays, Morarity, Cooper & Co.....	drilling
P & B, Judd, Geizer & Smullin.....	drilling
Forman, Mitchell & Steele.....	rig bldg
Slab Furnace, Warner.....	sand
" (Glass) Gukhart No 2.....	sand

Rockland or Red Valley.

Jas Pason, Crawford & Co.....	sand
Richardson, Piper & White.....	rig bldg

Mt. Hope and Smoky District.

S & G, Sheasley & Galbraith No 2.....	rig bldg
Miller, Galbraith & Co No 3.....	sand
" " No 4.....	rig
Galbraith, Shepard & Galbraith No 5.....	drilling

Vicinity Emlenton.

Emlenton, Porterfield & McCaub.....	drilling
J W Smith, J W Smith.....	rig

Bullion.

Hovis, Hovis & Co.....	drilling
Plumer, Hoffman & Co.....	rig
R Anderson, Reddick & Anderson.....	drilling
R S Grant, Wilson Bros.....	drilling

New rigs.....	22
Old rigs and shut down.....	8
Drilling.....	23

Total.....53

Clarion.

Berlin, Berlin & Sons.....	300
John Henel, Koch Oil Co No 8 (old).....	rig
Lloyd, Dr Metzger (old).....	rig
Shreller, McCallom & Co (old).....	rig
Wagner & Curl, J V Ritts (old).....	rig
Brown, J V Ritts (old).....	rig
Heasley, Heasley & Co (old).....	rig
Shuppen, John J Carter No 9.....	200
" " No 10.....	rig
De'oe, Kribbs & Co.....	100
Egypt, Hess & Eggers.....	600
Wagner, Hahn & Wagner.....	500
Reidsburg, M L Lockwood & Co.....	drilling

New rigs.....	1
Old rigs.....	6
Wells drilling.....	6

Total.....13

Butler and Armstrong.

F Miller, W G Crawford & Co (old).....	rig
Chas Dufley, Hoch & Co (old).....	rig
Stewart, T W Phillips & D Osborne No 6 (fishing).....	1,400
Dickey, T W Phillips & Osborne No 3.....	300
Markle, " " No 12.....	rig
Stahn, " " No 3.....	400
" " " No 2.....	1350
" " " No 1.....	shut down
Peiffer, Marshall Oil Co No 2.....	1350
J Dickey, Fisher Oil Co.....	100
Thorn Hill, Munhall & Co.....	rig bldg
Blakeley, Coast & Co No 2.....	rig
" Root & Johnson No 4.....	600
" " " No 5.....	rig
Walley, Walley & Jordan (old).....	rig
Saxonsburg, Kiskadden & Co (shut down).....	1550
Lenox, Greenley & Co.....	800

Craigtown, Guffey & Co (for gas).....	drilling
Frazier's Mills, Yeagle & Co.....	rig bldg
Miller Eddy, Joseph Thomas & Co.....	600
McElwe, Dennison & Fleegler.....	600
McCullough, Morrison & Albert.....	rig bldg
Rogers, Jos Hartman & Bros.....	600
Dufley, Davis Bros No 2.....	rig
Hickey, Boyd & Co No 7.....	1300
Kiltensbaugh, McTamany & Co No 1.....	1100
Guthrie, Thomas & Co.....	400
Williamson, ".....	drilling
Jennings, R Jennings.....	rig
Robinson, J Gorman.....	1500
Orton, J M Edwards.....	200
Story, Hazlewood Oil Co.....	50
H McLaughlin, Wheeler & Co.....	50
Joseph Knox, Devitt & Co.....	rig

St. Joe.

B'ppus, Phillips & Osborne No 3.....	1300
Lang, Hartman & Co.....	830
Shultz, Shultz & Co.....	50

Thorn Creek.

Harbison, Connors & Fishel (old).....	rig
Bulford, Iman & Co.....	1500
McLaughlin, Thorn Oil Co.....	sand
Bulford, Klingensmith.....	1100
" C D Greenlee No 1.....	rig

New rigs.....	11
Old rigs and shut down.....	4
Drilling.....	25

Total.....40

Washington.

I Wilson, Forest Oil Co (old).....	rig
Johnson, " (old).....	rig
Martin heirs, John McKeown No 6.....	1550
" " No 7.....	1400
" " No 8.....	450
" " No 9.....	600
" " No 10.....	1400

Cameron, Willets, Young & Chartiers Oil Co No 11.....	1550
Muncie, Willets & Son No 23.....	1700
Martin, Central Oil Co No 4.....	2275
Coal Center, Hornbake (shut down).....	1500
Wiles, C O & Gas Co No 1 (fishing).....	1800
McKeesport, Stone & Co.....	drilling
Wright, Chartiers Oil Co & F W Andrews (old).....	rig
Bane, Ten-Mile Oil Co.....	930
Fergus, Chartiers Oil Co No 3.....	1090
" " No 4.....	1750
" " No 5.....	1450
" " No 6.....	1100
Weaver, C O & Gas Co No 4.....	2100
Davis, Union Oil Co No 6.....	2250
" " No 1.....	500
California, J M Guffey (for gas).....	rig
Carson, Schmertz & Co (for gas).....	drilling
Miller, Marshall Oil Co.....	100

Taylorstown.

Carrothers, West Virginia Natural Gas Co No 1.....	1800
Hodgens, West Virginia Nat Gas Co No 1.....	1900
Noble, W Virginia Nat Gas Co No 2.....	2100
Hutchison, " (for gas).....	250
Dinsmore, " No 1.....	600
Robert Noble, " No 1.....	600
W B Carrothers, Hart Bros No 1.....	1600
Buchanan, R H Thayer & Co.....	1200
Carrothers, Caldwell & Co.....	1010
Blayne, Marshall Oil Co No 3.....	2400
Caudall, Anchor Oil Co No 2.....	1300
" " No 3.....	rig bldg
McLain, Iseman & Co.....	50
Work, Sharp & Co.....	rig
Miller, B B Campbell & J B Aiken.....	rig
Bailey, McKernan Oil Co.....	300
Sproul, Vandergrift & Reed.....	rig

New rigs.....	4
Old rigs.....	3
Drilling.....	30

Total.....37

Shannopin.

Thos Pinkerton, J S McKelvy (old).....	rig
Charles Eichel, Raccoon Oil Co No 4.....	rig
John Morrow, Raccoon Oil Co No 4.....	rig
Stone, J M Guffey & Co.....	sand
Andrews, Philadelphia Co.....	rig
Gillfillan, ".....	rig bldg

Greene County, Etc.

Fordyce, E M Hukill & Co No 1 (shut down).....	1300
Girard, E M Hukill & Co No 1.....	1060
Girard, E M Hukill & Co No 2.....	drilling
Hathaway, E M Hukill & Co No 1 (fishing).....	1060
Mt. Morris, E M Hukill & Co No 1.....	drilling
Longanecker, " (old).....	rig
Ninevah, Johnston & Hamilton.....	drilling
McGinnis farm, Wheeling Natural Gas Co (shut down).....	1100
Moundsville, J W Craig & Co.....	drilling
Bristoria, Forest Oil Co.....	1300
Biddle, E M Hukill & Co.....	drilling

New rigs.....	2
Old rigs and shut down.....	4
Drilling.....	6

Total.....12

FIELD OPERATIONS SUMMARIZED.

WELLS COMPLETED, WITH THE ESTIMATED PRODUCTION ON THE LAST DAY OF THE MONTH.

ALLEGANY FIELD.

Division of Field.	JULY, 1887.			JUNE, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Seio.....	0	0	0	1	5	0
Alma.....	0	0	0	0	0	0
Wirt.....	1	0	1	3	19	0
Bolivar.....	0	0	0	0	0	0
Clarksville.....	1	0	1	3	9	1
Genesee.....	0	0	0	0	0	0
Miscellaneous.....	0	0	0	0	0	0
Total.....	2	0	2	7	33	1

BRADFORD FIELD.

Division of Field.	JULY, 1887.			JUNE, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
E. and W. Branches.....	7	64	0	6	38	0
Kendall Creek.....	4	40	0	5	36	0
Foster Brook.....	1	6	0	1	8	0
Knapp's Creek.....	2	11	0	2	10	0
Four Mile.....	0	0	0	0	0	0
Indian & Meeks Creeks.....	3	22	0	3	22	0
Cole Creek.....	1	25	0	1	15	0
Kinzua.....	2	11	0	4	51	0
Miscellaneous.....	1	0	1	0	0	0
Total.....	21	179	1	22	180	0

WARREN AND FOREST.

District.	JULY, 1887.			JUNE, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Glade.....	10	78	5	12	832	3
Clarendon.....	10	51	0	12	60	0
Tiona.....	8	39	1	7	42	0
Cooper.....	1	10	0	0	0	0
Balltown.....	1	8	0	1	10	0
Kane.....	0	0	0	1	10	0
Grand Valley.....	13	97	0	27	137	4
Miscellaneous.....	5	50	1	9	82	2
Total.....	48	333	7	69	1173	9

LOWER COUNTRY.

District.	JULY, 1887.			JUNE, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Venango.....	40	200	9	32	173	7
Clarion.....	7	40	1	3	7	1
Butler & Armstrong.....	36	966	14	36	1861	15
Washington.....	7	350	1	10	2953	2
Shoustown, Etc.....	1	25	0	0	0	0
Total.....	91	1581	25	81	4994	25

GRAND SUMMARY.

District.	JULY, 1887.			JUNE, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Allegany.....	2	0	2	7	33	1
Bradford.....	21	179	1	22	180	0
Warren and Forest.....	48	333	7	69	1173	9
Lower Field.....	91	1581	25	81	4994	25
Total June.....	162	2093	35	179	6380	35
Total July.....	179	6380	35			
Difference.....	17	4287	0			

Rigs Up and Building—Wells Drilling.

ALLEGANY FIELD.

Division of Field.	JULY 31, 1887.				JUNE 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Seio.....	0	5	0	5	1	4	0	5
Alma.....	0	5	0	5	0	5	0	5
Wirt.....	0	2	1	3	1	7	1	9
Bolivar.....	0	2	0	2	0	2	0	2
Genesee.....	0	2	2	4	0	2	2	4
Clarksville.....	0	5	1	6	1	5	2	8
Miscellaneous.....	0	0	0	0	0	0	0	0
Total.....	0	34	4	38	3	31	3	37

BRADFORD FIELD.

Division of Field.	JULY 31, 1887.				JUNE 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
E. and W. Branches.....	1	7	3	11	1	8	4	13
Kendall Creek.....	0	0	3	3	0	0	1	1
Knapp's Creek.....	0	3	0	3	0	3	1	4
Foster Brook.....	0	3	2	5	1	4	1	6
Four Mile.....	0	3	1	4	0	3	1	4
Indian Creek.....	1	1	1	3	1	1	1	3
Cole Creek.....	0	5	0	5	0	5	0	5
Kinzua.....	1	1	1	3	0	0	1	1
Miscellaneous.....	0	0	1	1	0	0	1	1
Total.....	3	23	12	43	3	24	16	49

WARREN AND FOREST.

Division of Field.	JULY 31, 1887.				JUNE 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Glade.....	2	0	7	9	2	0	4	6
Clarendon.....	4	5	5	14	5	5	2	12
Tiona.....	3	2	5	10	3	0	3	6
Cooper.....	0	0	0	0	0	2	1	3
Balltown.....	0	1	1	2	1	2	2	5
Kane.....	0	2	2	4	0	2	1	3
Grand Valley.....	2	11	5	18	2	5	4	11
Miscellaneous.....	1	1	12	14	6	0	6	12
Total.....	18	26	37	81	22	17	29	68

LOWER COUNTRY.

Division of Field.	JULY 31, 1887.				JUNE 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Venango.....	23	2	23	48	13	14	15	42
Clarion.....	1	6	6	13	3	7	6	16
Butler & Armstrong.....	11	4	25	40	5	8	38	51
Washington.....	4	3	30	37	2	3	25	30
Shoustown, Etc.....	2	4	6	12	0	4	6	10
Total.....	40	25	90	155	23	36	90	149

GRAND SUMMARY.

Field.	JULY 31, 1887.				JUNE 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Allegany.....	0	34	4	38	0	31	2	33
Bradford.....	0	23	12	35	0	24	16	40
Warren and Forest.....	18	26	37	81	22	17	29	68
Lower Country.....	40	25	90	155	23	36	90	149
Total.....	66	108	143	317	67	108	138	313
Total June 30.....	67	108	138	313				
Difference.....	1	0	5	4				

Zoar.

The doubts which enveloped one of the mystery wells at Zoar have all been cleared away. Sill & Co.'s well on the Coon farm, northeast of the Pioneer well on the White farm, has been drilled to a depth of 1703 feet and abandoned as a failure. The contractor, Mr. P. J. Lawton, furnished an AGE representative with the following record:

Drive pipe.....	195 feet
Gas in black shells at.....	251 "
Well cased at.....	400 "
Gas (enough to fire boiler) at.....	620 "
Limestone, 15 feet thick, at.....	1250 "
Corniferous limestone at.....	1598 "
Depth in limestone.....	135 "
Depth of well.....	1733 "

There was enough gas in the corniferous limestone to fire three boilers. The drilling in this rock was very hard and the drillers were only able to make about eight feet per day. After drilling 135 feet into this rock it was decided not to go any deeper. Mr. Coon, the owner of the farm, did not care to buy the casing in the well and it was pulled on the 9th of August. Frederick & Co.'s well on lot 29, on the south side of Cattaraugus Creek and further up the stream, tapped the corniferous limestone at 1630 feet, and at last accounts they had passed below the corniferous limestone and were drilling in slate. Like Sill & Co.'s well this venture is also a failure. Roth, Peffer, Dyer & Jennings' wildcat at Snyder's Corners, in the southeastern part of Persia township, is shut down at this writing. They are probably waiting for Colonel Dyer's Mascot to wave a wand over the derrick before the drill gives its final taps to the rock. F. Kreiner & Co. have a rig up on the Allen Potter farm, lot 22, in Leon township, four miles southwest of the venture at Snyder's Corners.

The Standards's First Flagrant Deal in Oil Region Journalism.

For years the Standard Oil Co. has required its hirelings in the newspaper business to pose as friends of the producers while doing the work of the Standard. It has not always been easy to trace the subtle underground connection between the subsidized minions and the Standard's depository of crisp greenbacks, but it existed just the same. Prior to the late unpleasantness over the Billingsley bill this plan worked all right. Of course the producer was often thrown in the air when his interests clashed with those of the Standard's, but taffy from a Standard press soon lulled him into forgetfulness, and he continued to furnish the means that nerved the arm that stabbed him in the back. The situation of the monopoly during the Billingsley campaign became desperate and the morning papers in Oil City, Titusville and Bradford could no longer do their vile work under cover. Long before McManes' Philadelphia delegation got in its work on the Billingsley bill the true position of the Oil City *Derrick*, the Titusville *Herald* and the Bradford *Era* was established. The Standard people finding that cunning double-faced work can no longer be done with a morning paper in Bradford, have purchased the interest in the *Era* which they did not previously control, and placed Mr. Patrick C. Boyle in charge as manager. The notice of the change first appears in the *Era* of August 12. As published in papers outside of the region there is a hazy indefiniteness about the identity of the new owners, and they are generally rated as an "oil region syndicate. The following is the first flagrant, open and above-board acknowledgement that the Standard people ever made that they were in the newspaper business:

CHARTER NOTICE.

"Notice is hereby given that application will be made to the Governor of the State of Pennsylvania, at Harrisburg, Pa., on Thursday, September 8, A. D. 1887, at 10 o'clock a. m. of said day, or as soon thereafter as may be, for the incorporation of a company in pursuance of the act of the General Assembly, entitled 'An act to provide for the incorporation and regulation of certain corporations,' approved the 29th day of April, A. D. 1874, and its several supplements, to be known as 'The Era Publishing Company,' whose character and object shall be the publishing of a daily newspaper and the transaction of a general publishing and printing business. The place where the business of said company shall be conducted is the city of Bradford, McKean county, Pa., at which place its principal office shall be located. The names of five (5) of the subscribers to the capital stock of said company are: H. McSweeney, C. H. Lay, Jr., F. G. Ridgway, John R. Campbell, and Wm. T. Scheide. H. McSweeney, Solicitor."

The above named gentlemen are all in the employ of the National Transit Co., a branch of the Standard Oil Co. H. McSweeney is attorney for the company, C. H. Lay, Jr., is Assistant Treasurer, F. G. Ridgway is Registrar, John R. Campbell is Treasurer, and everybody at Harrisburg found out who General Manager W. T. Scheide was before he thought of declaring himself a newspaper publisher for the producers. Will Patrick C. Boyle, manager for the company, now deny that the Standard has dictated a line of policy for the Oil City *Derrick* since he has been its lessee?

THE East Brady Caloric Co. has sold its plant to the new gas company, Cummings, Royce & Co., who will have entire control of the natural gas in that section. An advance in rates is reported to be in contemplation.

Occurrence of Petroleum in India.*

All the petroleum in India occurs in middle or lower tertiary rocks, as in Galacia and at Baku. Within the Rawalpindi district of the Punjab, petroleum is found at 16 localities. The most productive spring appears to be at Gunda, where for six months an average of 11 gallons a day was obtained from a boring 75 feet deep.

There can be no doubt that the oil resources of the coal fields of Upper Assam are very great. Borings for petroleum at Makum gave highly satisfactory results. None of the bore-holes were deeper than 200 feet, yet in some the oil spouted intermittently with a pressure of 30 pounds to the square inch, the yield being as much as 3500 gallons in 35 hours from a single pipe. Owing to the difficulties of transport the enterprise was abandoned. At the present time the best ground is within the concession granted to the Assam Railways and Trading Co., but the oil is neglected.

The coast of Arakan and the adjacent islands have long been remarkable for the mud volcanoes caused by the eruption of hydrocarbon gasses. Petroleum occurs in the neighborhood, as much as 40,000 gallons a year being exported by the natives from Kyaukpyu. The oil is very light and pure. In 1877 European enterprise was attracted to this industry, and excellent results were at once obtained. In 1879 works were undertaken by the Borongo Oil Co. The company started work on a large scale, and in 1883 had 24 wells in operation, ranging from 500 to 1200 feet in depth, one well yielding for a few weeks 1000 gallons daily. The total amount of crude oil pumped from 10 wells during the whole year was not more than 234,000 gallons; and in 1884 the company had to suspend payment. Large supplies of high-class petroleum could, without doubt, be obtained from this region if suitable methods of working were employed.

Rangoon oil, probably an object of industry in prehistoric times, comes from Upper Burma, from Yenanchaung, on the east side of the Irawadi. The greater portion of the yield is sent to Rangoon. The quantity sent during the year 1883-4 amounted to 1,000,000 gallons. The oil resources of Burma undoubtedly admit of an indefinite extension of enterprise, yet the country still imports 2,000,000 gallons of American mineral oil annually.—*Eng. and Min. Journal*.

Indiana Gas Notes.

Leading capitalists at Fort Wayne, including John H. Bass, Wm. Fleming and others, have submitted a proposition to pipe gas to Wabash and supply the fluid to citizens at 50 per cent. of the present cost of fuel. The Fort Wayne gentlemen are supposed to be interested in the purchase of the Jumbo well at Fairmount.

The well at Jeffersonville, Indiana, was down 425 feet August 16, and was producing gas at the rate of 1,500,000 cubic feet per day. The Trenton rock is expected at 900 feet. Four distinct veins were struck at depths of 80, 110, 276 and 313 feet. The first three flows were cased off and would double the present output.

Wells will be sunk at Utica, where gas and bitumen bubbles up in the river; also at Brady's cement mills, Armstrong's farm, Howard's Park, Henryville and Charlestown. The latter place is also expected to develop a large salt well, as there is a heavy saline outflow on Fourteen-mile creek. Orlando Hobbs, geologist, who predicted gas two years ago and located the present well, thinks the region is underlaid by a vast oil field.

*Records of the Geological Survey of India, Vol. XIX., 1886, p. 185 and p. 204.

More Incorporations for Oil and Natural Gas.

Presque Isle Natural Gas Co., Erie, Pa.
 Dublin Natural Gas Co., Dublin, Indiana.
 Fayetteville Natural Gas, Oil and Mining Co., Fayetteville, Arkansas.

Meade Centre Gas, Fuel and Water Co., Meade Centre, Kansas.

Fisherville Natural Gas Co., Fisherville, Kentucky.
 Chanute Coal, Gas and Ore Mining Co., Chanute, Kansas.

Greeley Gas and Coal Co., Greeley, Kansas.
 Seneca Falls Natural Gas Co., Seneca Falls, N. Y.
 National Oil Trust Co., East St. Louis, Ill.
 Scott Avenue Deep Gas Well Co., Fort Scott, Kansas.
 Enterprise Gas and Oil Co., Enterprise, Ohio.
 Winget Oil and Gas Co., Wapakoneta, Ohio.
 Glasgow Natural Gas Co., Glasgow, Ohio.
 Kankakee Natural Gas Co., Kankakee, Ill.
 Flint Coal, Oil and Natural Gas Co., Flint, Mich.
 Star Gas and Oil Co., Logan, Ohio.
 Capital City Natural Gas Co., Lansing, Mich.
 Stillwater Natural Gas Co., Dayton, Ohio.
 Fort Worth Natural Gas and Artesian Water Co., Fort Worth, Texas.

Kentucky Natural Gas Co., Louisville, Ky.
 Council Grove Gas and Mining Co., Council Grove, Kansas.

Hutchinson Natural Gas Co., Hutchinson, Kansas.
 Rocky Ridge Natural Gas and Oil Co., Rocky Ridge, Ohio.

The Kentucky Natural Gas Co., Louisville, Ky. Capital stock, \$1,000,000.

People's Natural Gas and Oil Co., Fort Wayne, Ind. Capital stock, \$10,000.

Cook County Natural Gas, Oil and Water Co. Chicago, Ill. Capital stock, \$30,000.

Manufacturers' Natural Gas Association, Indianapolis, Ind. Capital stock, \$10,000.

New Corning Gas Co., New Corning, Delaware county, Ind. Capital stock, \$10,000.

Arkansas City Natural Gas and Coal Co., Arkansas City, Kansas. Capital stock, \$50,000.

Hector Oil and Natural Gas Co., Monroe, Mich. Capital stock, \$500,000.

It is claimed that three wells near Albert Lea, Minnesota, show the existence of natural gas in large quantities. When first sunk some of these wells produced such a flow of gas that they were filled up as useless, and others now used for water pour four continued streams of gas and when lighted burn with considerable flame. A company has been formed and 10,000 acres of land leased.

A 500-pound gasser is reported on the Dr. Boal farm, near Baden, in the Sheffield district. It is the property of the Citizens' Natural Gas Co., and will be used to supply the new line to New Castle.

ANOTHER gas well was struck at Nelsonville, O., last month, and the Nelsonville Gas Co. now has an abundant supply.

EAST PALESTINE, Ohio, is drilling for gas. Mr. J. Reid, of Darlington, Pa., has the contract at \$1.20 per foot.

ANOTHER large surface gas well has been opened near Carrothers, Ohio.

NATURAL gas was struck August 9 near Kankakee, Illinois.

SUMMARY of the Statements of the National Transit Company for June and July:

	July. Barrels.	June. Barrels.
Receipts from all sources.....	1,584,532.39	1,688,785.15
Deliveries.....	1,637,751.05	1,798,010.52
Gross stocks end of month.....	32,912,595.80	32,884,448.83
Sediment and surplus.....	4,237,448.98	4,152,801.13
Total liabilities end of month.....	28,675,146.82	28,731,647.70
Outstanding acceptances.....	20,911,036.33	21,697,036.33
Credit balances.....	7,764,110.49	7,034,611.37

The above "receipts from all sources" for July were made up as follows:

Runs from wells.....	1,253,143.14
Received from other lines.....	331,389.25
Total.....	1,584,532.39

The above "total deliveries" for July were made up as follows:

Regular shipments.....	1,600,224.47
Delivered to other lines.....	37,526.58
Total.....	1,637,751.05

The above "receipts from all sources" for June were made up as follows:

Runs from wells.....	1,314,078.29
Received from other lines.....	374,706.86
Received in iron tanks.....	
Total.....	1,688,785.15

The above "total deliveries" for June were made up as follows:

Regular shipments.....	1,760,679.00
Delivered to other lines.....	37,331.52
Total.....	1,798,010.52

SUMMARY of the Statement of the Tidewater Pipe Company, Limited, for July, 1887:

Quantity of crude petroleum in custody at beginning of July.....	Barrels. 1,561,836.52
Quantity of crude petroleum at close of July.....	1,717,376.06
Less sediment and surplus.....	180,615.32
Receipts during July.....	1,536,760.74
Received in iron tanks.....	165,757.97
Deliveries during July—to refiners.....	37,516.76
“ “ “ to other parties.....	225,275.86
Outstanding certificates, accepted orders, etc.....	225,275.86
Credit balances.....	881,000.00
Total liabilities, July 31, 1887.....	1,536,760.74

JUNE SUMMARY.

Quantity of crude petroleum in custody at beginning of June.....	Barrels. 1,567,978.78
Quantity of crude petroleum at close of June.....	1,736,551.28
Less sediment and surplus.....	174,714.76
Receipts during June.....	1,561,836.52
Received in iron tanks.....	176,089.25
Deliveries during June—to refiners.....	37,341.31
“ “ “ to other parties.....	217,690.05
Outstanding certificates, accepted orders, etc.....	217,690.05
Credit balances.....	881,000.00
Total liabilities June 30, 1887.....	1,561,836.52

A GOOD gas well has been discovered on the Metcalf farm, three miles southeast of Freeport, Pa. It opens up a new gas district.

CANADIAN refined oil is worth 10 cents a gallon, while the crude article is quoted at 67 cents a barrel.

PUEBLO, Colorado, is to be supplied with natural gas, which has been found within seven miles of the city.

THE U. S. Geological Survey estimates that the amount of coal displaced by natural gas in 1886 was 6,353,000 tons, valued at \$9,847,150.

THE Petroleum Fuel Co. of Detroit, Mich., has been incorporated with a capital stock of \$5,000,000.

AMIE ARGAND, the inventor of the Argand lamp; lived and died poor, disappointed and neglected.

THE Tidewater Pipe Line Co. has completed its pipe line from Tamanend, Pa., to Bayonne, N. J.

Stocks Abroad.

Reports of stocks in London, and the seven principal Continental ports, are summarized in the following statement:

STOCKS AFLOAT AND ASHORE.	July 23, 1887. Barrels.	June 25, 1887. Barrels.
Seven Continental Ports	1,275,721	1,067,272
London	192,831	220,179
Total Stocks afloat and ashore	1,468,552	1,287,451
Increase in stocks since June 25	181,101	310,350

A detailed statistical table giving the stocks on hand, the stocks in vessels on the ocean, and the amount unloading from the vessels at the different ports, is appended, which shows at a glance the condition of affairs abroad and the increase or decrease as compared with the corresponding period of 1886. The shipments represent the amount of oil going to the interior of Europe from the seaports:

STOCKS IN FOREIGN PORTS JULY 23, 1887.

PORTS.	Stocks week ending July 23.		Stocks afloat week ending July 23.		Loading. Week ending July 23.		Grand total stocks afloat and loading.		Receipts From July 1.		Shipments from July 1.	
	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.
London	176,745	166,331	6,164	200	25,000	26,300	207,909	192,831	14,800	97,995	15,386	28,184
Bremen	218,162	242,307	21,960	12,622	63,500	---	303,622	254,929	29,052	116,696	22,266	23,775
Hamburg	176,322	170,965	81,348	121,603	67,800	73,000	328,470	365,568	62,317	123,275	40,587	37,361
Antwerp	172,569	140,609	40,260	35,634	40,100	36,000	252,929	212,243	38,908	60,781	27,049	21,850
Rotterdam	104,094	117,254	40,949	22,502	26,100	23,000	171,143	162,836	38,721	101,415	16,596	34,221
Amsterdam	56,447	41,026	34,886	---	2,500	9,000	93,833	50,026	45	18,627	11,076	8,831
Stettin	57,689	75,917	30,995	78,403	23,200	52,500	111,844	205,820	50,138	46,817	9,242	9,412
Danzig	9,060	18,299	6,371	---	2,000	6,000	17,431	24,299	---	---	1,017	963
Total	794,343	805,377	259,729	270,844	225,200	199,500	1,279,272	1,275,721	219,191	467,611	127,833	139,413
Total stocks Continental Ports	1,575,344	1,033,248	794,343	805,377	---	---	---	---	---	---	---	---
Total afloat, "	123,398	252,238	259,729	270,844	---	---	---	---	---	---	---	---
Total loading	182,300	130,000	225,200	199,500	---	---	---	---	---	---	---	---
Total	1,881,042	1,415,486	1,279,272	1,275,721	---	---	---	---	---	---	---	---
Afloat and loading for direct Continental Ports	20,000	17,700	9,100	---	---	---	---	---	---	---	---	---
" " " Baltic Sea, exclusive Stettin and Danzig	7,900	36,300	50,100	26,800	---	---	---	---	---	---	---	---
" " " Total Continental Ports	1,908,942	1,469,486	1,338,472	1,302,521	---	---	---	---	---	---	---	---
" " " Total London	255,570	189,621	207,909	192,831	---	---	---	---	---	---	---	---
" " " English harbors, exclusive London	53,000	50,800	61,000	38,400	---	---	---	---	---	---	---	---
Grand total	2,217,512	1,700,907	1,607,381	1,533,752	---	---	---	---	---	---	---	---

OFFICIAL STATEMENT—EXPORTS OF PETROLEUM, JUNE, 1887.

BY WM. F. SWITZLER, CHIEF OF BUREAU OF STATISTICS, WASHINGTON, D. C., JULY 8, 1887.

CUSTOMS DISTRICTS.	MINER'L, CRUDE		NAPHTHAS.		ILLUMINATING.		LUBRICATING & PARAFFINE OILS.		RESIDUUM.		TOTAL.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Boston and Charles-town, Mass.	---	---	2,000	640	827,805	83,332	20,131	3,614	---	---	849,936	87,586
New York, N. Y.	1,659,020	114,663	1,125,040	96,629	33,342,438	2,581,161	1,034,761	209,504	4,116	368	37,165,375	3,002,325
Philadelphia, Pa.	2,515,155	147,879	437,400	32,170	11,973,055	888,030	7,428	670	---	---	14,933,038	1,068,749
Baltimore, Md.	---	---	---	---	928,836	63,708	13,759	1,651	---	---	942,595	65,359
Total for June, 1887	4,174,175	262,542	1,564,440	129,439	47,072,134	3,616,231	1,076,079	215,439	4,116	368	53,890,944	4,224,019
Total for June, 1886	6,492,442	429,332	957,275	82,231	47,970,144	3,828,677	1,038,767	213,447	262,122	14,639	56,721,020	4,568,436
Total for 12 months ending June 30, 1887	76,059,269	4,859,991	15,642,645	1,360,332	464,433,065	35,960,977	16,711,044	3,085,595	3,248,860	156,579	576,094,833	45,423,474
Total for 12 months ending June 30, 1886	80,033,856	5,843,291	12,106,229	961,241	463,931,634	40,050,203	12,186,156	2,432,320	3,223,500	188,594	571,483,375	49,478,649

CRUDE QUOTATIONS FOR JULY, 1887.

Day of Month and week.	BRADFORD.				OIL CITY.				NEW YORK.				PITTSBURGH.			
	Opened ...	Highest ...	Lowest ...	Closed ...	Opened ...	Highest ...	Lowest ...	Closed ...	Opened ...	Highest ...	Lowest ...	Closed ...	Opened ...	Highest ...	Lowest ...	Closed ...
F 1	61½	61½	61½	61½	61½	61½	61½	61½	61½	61½	61½	61½	61½	61½	61½	61½
S 2	Holiday	---	---	---	61¼	61¼	60¾	61	Holiday	---	---	---	Holiday	---	---	---
M 4 Holiday	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
T 5	61¼	61½	60¾	60¾	61¼	61¼	60¾	60¾	61½	61¼	60¾	60¾	61½	61½	60¾	60¾
W 6	60¾	60¾	60¾	60¾	60¾	60¾	60	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60	60¾
T 7	60¾	61½	60¾	61	60¾	61½	60¾	61½	60¾	61½	60¾	61½	60¾	61½	60¾	61½
F 8	61¼	61¼	60¾	60¾	61¼	61¼	60¾	60¾	61¼	61¼	60¾	60¾	61¼	61¼	60¾	60¾
S 9	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾
M 11	60¾	61½	60¾	60¾	60¾	61¼	60¾	60¾	60¾	61¼	60¾	60¾	60¾	61¼	60¾	60¾
T 12	60¾	61	60¾	60¾	60¾	61½	60¾	60¾	60¾	61	60¾	60¾	60¾	61	60¾	60¾
W 13	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾
T 14	60¾	60¾	60¾	60¾	60¾	61	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾	60¾
F 15	60¾	60¾	59¾	59¾	60¾	60¾	59¾	59¾	60¾	60¾	59¾	60	60¾	60¾	59¾	59¾
S 16	60	60¾	60	60¾	60	60¾	60	60¾	60	60¾	60	60¾	60	60¾	60	60¾
M 18	60¾	61	60¾	60¾	60¾	61½	60¾	60¾	60¾	61½	60¾	60¾	60¾	61	60¾	60¾
T 19	60¾	60¾	59¾	59¾	60¾	60¾	59¾	60	60¾	60¾	59¾	59¾	60¾	60¾	59¾	60
W 20	60	60	59¾	59¾	60	60¾	59¾	59¾	60	60¾	59¾	59¾	60	60	59¾	59¾
T 21	59¾	60¾	59¾	59¾	60	60¾	59¾	60	59¾	60¾	59¾	59¾	59¾	60¾	59¾	60
F 22	59¾	59¾	59¾	59¾	60	60	59¾	59¾	59¾	59¾	59¾	59¾	60	60	59¾	59¾
S 23	59¾	59¾	57	57¼	59¾	59¾	57	57¼	59¾	59¾	57¼	57¼	59	59¾	56¾	57¾
M 25	57¼	57¾	55¼	56¼	57½	57½	55½	56¼	57¾	57¾	55½	56¾	57½	57¾	55¼	56¼
T 26	56¼	56¾	55¾	55¾	56¾	56¾	55¾	55¾	56¾	56¾	55¾	56	56¾	56¾	55¾	56
W 27	55¾	55¾	54¾	54¾	56¾	56¾	54¾	54¾	56¾	56¾	54¾	54¾	56	56	54¾	54¾
T 28	54¾	57¾	54¾	56¾	54¾	57¾	54	56¾	54	54¾	54	56¾	54¾	57½	54¾	56¾
F 29	56¾	56¾	55¾	55¾	55¾	56¾	55¾	55¾	56¾	57	55¾	55¾	56¾	56¾	55¾	55¾
S 30	55¾	58¼	55¾	58¼	55¾	58¼	55¾	58¼	55¾	57¾	55¾	57¾	55¾	58¼	55¾	58¼

Runs, Shipments and Stocks.

RUNS OR RECEIPTS.

PIPE LINE.	JULY, 1887.	JUNE, 1887.
National Transit Co.....	1,253,143.14	1,314,078.29
Tidewater.....	167,757.97	176,089.25
Octave Oil Co.....	1,843.00	2,469.28
Keystone Pipe Line.....	23,139.30	35,350.72
Pittsburgh Pipe Line.....	100,639.34	111,278.14
Southwest Pennsylvania.....	306,328.69	263,134.15

Total.....	1,852,851.44	1,902,399.83
Daily average.....	59,769.40	63,413.33

In the above runs only the oil received by the National Transit Co. directly from the wells, is included.

DELIVERIES OR SHIPMENTS.

PIPE LINE.	JULY, 1887.	JUNE, 1887.
National Transit Co.....	1,600,224.47	1,760,679.00
Tidewater.....	225,275.86	217,690.05
Octave Oil Co.....	1,195.00	2,593.23
Keystone Pipe Line.....	22,639.38	25,724.39
Pittsburgh Pipe Line.....	102,964.58	112,007.21
Southwest Pennsylvania.....	274,534.34	305,890.96

Total.....	2,226,833.63	2,424,584.84
Less oil transferred between lines.....	331,389.25	374,706.86

Total.....	1,895,444.38	2,049,877.98
Daily average shipments.....	61,143.37	68,329.26

In the above shipments only the oil delivered to refiners is included.

Daily excess of shipments over runs, July.....	1,373.97
Daily excess of shipments over runs, June.....	4,915.93
Daily excess of shipments over runs, May.....	5,072.36
Daily excess of runs over shipments, April.....	4,083.45
Daily excess of shipments over runs, March.....	7,983.78
Daily excess of shipments over runs, February.....	3,564.10
Daily excess of shipments over runs, January, 1887.....	8,702.88
Daily excess of shipments over runs, December.....	11,270.81
Daily excess of shipments over runs, November.....	10,818.54
Daily excess of shipments over runs, October.....	580.75
Daily excess of runs over shipments, September.....	8,057.13
Daily excess of runs over shipments, August.....	11,931.56
Daily excess of runs over shipments, July.....	5,357.20
Daily excess of runs over shipments, June.....	4,793.41
Daily excess of runs over shipments, May.....	3,967.06
Daily excess of shipments over runs, April.....	4,899.20
Daily excess of shipments over runs, March.....	4,561.80
Daily excess of runs over shipments, February.....	14,701.52
Daily excess of shipments over runs, January, 1886.....	7,825.68

NET STOCKS.

PIPE LINE.	JULY 31, 1887.	JUNE 30, 1887.
National Transit Co.....	28,675,146.82	28,731,647.70
Tidewater.....	1,536,760.74	1,561,836.52
Octave Oil Co.....	4,986.00	3,235.13
Keystone Pipe Line.....	37,271.30	36,771.38
Pittsburgh Pipe Line.....	134,761.91	135,024.64
Southwest Pennsylvania.....	1,154,026.63	1,122,231.67
Total.....	31,542,952.80	31,590,747.04

Stocks decreased July.....	47,794.24
Stocks decreased June.....	174,012.20
Stocks decreased May.....	286,403.15
Stocks increased April.....	112,893.77
Stocks decreased March.....	257,699.31
Stocks decreased February.....	103,988.75
Stocks decreased January, 1887.....	777,975.85
Stocks decreased December.....	357,196.56
Stocks decreased November.....	286,526.86
Stocks decreased October.....	1,790.72
Stocks increased September.....	214,073.99
Stocks increased August.....	362,652.56
Stocks increased July.....	188,510.62
Stocks increased June.....	216,583.97
Stocks increased May.....	110,800.44
Stocks decreased April 1886.....	165,635.61

RECEIPTS. DELIVERIES.

Daily average July.....	59,769	61,143
Daily average June.....	63,413	68,329
Daily average May.....	64,522	69,594
Daily average April.....	65,072	60,988
Daily average March.....	63,915	71,899
Daily average February.....	63,374	66,938
Daily average January, 1887.....	62,629	71,332
Daily average December.....	67,857	79,127
Daily average November.....	70,767	81,586
Daily average October.....	76,019	76,600
Daily average September.....	77,989	69,932
Daily average August.....	76,880	64,949
Daily average July.....	74,880	69,323
Daily average June.....	75,811	71,017
Daily average May.....	68,602	64,635
Daily average April 1886.....	64,228	69,127

NOTE—The above figures are in barrels of 42 gallons each, and include only the pipe lines of the New York and Pennsylvania oil regions. In addition to the above receipts from 1200 to 1600 barrels of oil a day are shipped by rail out of the region by large producing firms which have no chartered pipe line.

SHENANGO & ALLEGHENY R. R.

TAKES EFFECT MONDAY, JULY 11, 1887.

Trains are run by Standard Central Time (90th Meridian.)

NORTHWARD.						STATIONS.						SOUTHWARD.					
6	4	2										1	3	5			
P. M.	A. M.	A. M.				Ar.	Greenville.	Dp.				A. M.	A. M.	P. M.			
6 35	11 55	8 20					Shenango.					6 50	11 10	3 50			
6 25	11 45	8 10					Kremis.					7 00	11 20	4 00			
6 13	11 32	7 58					Fredonia.					7 11	11 32	4 11			
6 04	11 23	7 50					Coolspring.					7 20	11 42	4 20			
5 58	11 18	7 45					Kerby Siding.					7 24	11 46	4 25			
5 57	11 16	7 44					Mercer.					7 25	11 47	4 26			
5 47	11 05	7 35					Pardoe.					7 35	11 57	4 37			
5 37	10 55	7 25					Filer.					7 45	12 07	4 46			
5 33	10 51	7 20					Grove City.					7 49	12 11	4 50			
5 26	10 44	7 12					Reed.					7 58	12 18	4 58			
5 23	10 41	7 09					Harrisville.					8 00	12 20	5 00			
5 13	10 30	6 59					Wick.					8 11	12 31	5 13			
5 08	10 26	6 54					Branchton.					8 15	12 35	5 17			
5 03	10 21	6 49					Coaltown Junction.					8 20	12 40	5 22			
5 00	10 18	6 45					Keisters.					8 21	12 41	5 23			
4 57	10 16	6 42					Slippery Rock Park.					8 24	12 44	5 26			
4 53	10 12	6 39					Hullston.					8 29	12 47	5 29			
4 50	10 09	6 36					Euclid.					8 32	12 50	5 32			
4 42	10 01	6 28					Jamisonville.					8 42	1 00	5 42			
4 33	9 52	6 18					Oneida.					8 51	1 10	5 52			
4 25	9 45	6 10					P. & W. Junction.					8 59	1 18	6 00			
4 15	9 35	6 00					Butler.	Ar.				9 10	1 30	6 10			
4 05	9 30	5 55					Pittsburgh & Western R. R.					9 13	1 35	6 15			
12 40	7 20						Allegheny.					11 20	4 00	8 00			
P. M.	A. M.	A. M.										A. M.	P. M.	P. M.			

HILLIARD BRANCH.

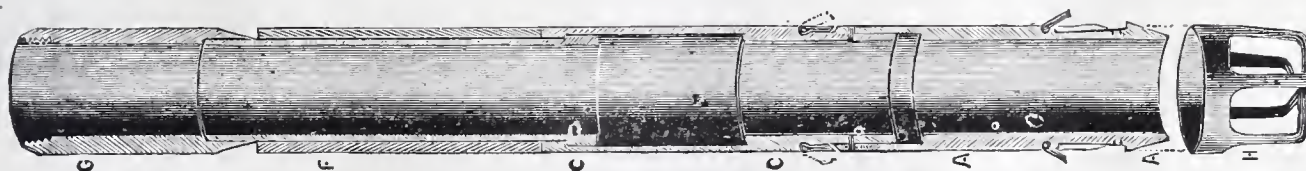
34	32	STATIONS.						33	35						
A. M.	A. M.							A. M.	P. M.						
12 00	6 40	Ar.	Branchton.	Dp.				8 45	5 30						
11 50	6 35		Bovard.					8 55	5 35						
11 30	6 15		Annandale.					9 15	6 00						
11 20	6 07		Roy.					9 25	6 10						
11 00	6 00	Dp.	Hilliard.	Ar.				9 35	6 20						
A. M.	A. M.							A. M.	P. M.						

Trains 4 and 5 run daily with through coach service between Allegheny, Chautauqua Lake and Jamestown, N. Y. All other trains daily except Sunday.

I. D. STINSON, G. P. A.,
Greenville, Pa.

J. T. BLAIR, Gen. Man.,
Greenville, Pa.

Pat. July 6, '86. MILLER AUTOMATIC PACKER Pat. July 27, '87.



PACK GUARANTEED.

FOR OIL AND GAS WELLS.

EASILY DRAWN OUT

Supports the Casing and Packs at any Point in the Well.

JUST THE PACKER FOR WELLS HAVING LEAKY CASING. Packers for 6 in. and 5½ in. wells have 4¼ in inside diameter to drill or pump through. Also reduced to any size tubing for flowing wells or small gas wells. Write for Circular.

Telephone 523.

MILLER & McCONNELL, 144 Fifth Av., Pittsburgh, Pa.

THE PETROLEUM AGE.

ACME OIL COMPANY,

→ **REFINERS OF PETROLEUM** ←

MANUFACTURERS OF THE

CROWN ACME OIL

Prepared with Great Care for Family Use.

ABSOLUTELY SAFE,

AND THE

Best Illuminator in the World.

WORKS AT OLEAN, N. Y., & TITUSVILLE, PA.

MAIN OFFICE, 26 BROADWAY, N. Y.

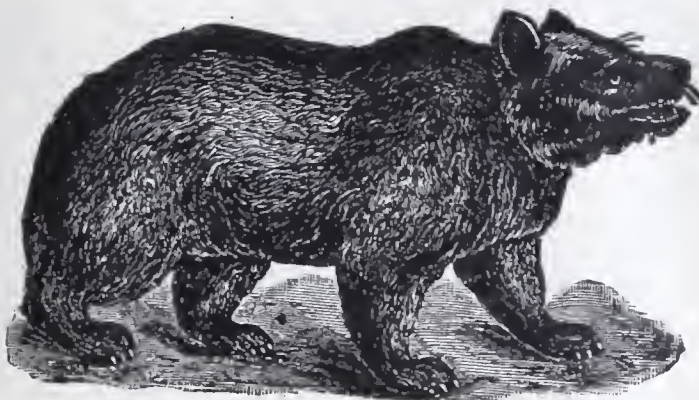
B. B. CAMPBELL, CHAIRMAN.

B. P. CRAWFORD, TREASURER.

BEAR CREEK REFINING CO., (LIMITED.)

REFINERS

OF THE BEST
Illuminating Oils
MADE.



BRANDS :

URSOLEUM—Strictly water white, 48° gravity, or better, fire test, 150°.

RAILROAD.—Water white, 47° gravity, fire test, 150°.

BEAR CREEK — Standard white, 46° gravity, fire test, 110°.

Gasolines and Deodorized Benzines of excellent quality and all gravities.

REFINERY, COLEMAN STATION, A. V. R. R. OFFICE, COR. 11TH & ETNA STS., PITTSBURG, PA.

JOHN COCHRAN,

MANUFACTURER OF J. M. DAVIDSON'S

PATENT REVERSE TWIST STEEL SUCKER RODS.

We would call the attention of Producers to the fact that these Rods have been improved by upsetting the end before welding, giving about double the stock in the weld.

The advantages of these Rods over wooden are

No Rivets, No Warping, No Waiting for Rods to Settle Through Paraffine.

A special advantage is where wells are pumped with sucker rod motion. The new rods are giving the best of satisfaction to parties using them.

Rods made for 1 1-4 inch and 2 inch Tubing.

Factory! Chestnut Street, Near B., B. & K. Freight Depot,
LOCK BOX 1543,
BRADFORD, PA.

THE STANDARD PRESSURE REGULATOR.

Designed Especially for Natural Gas.

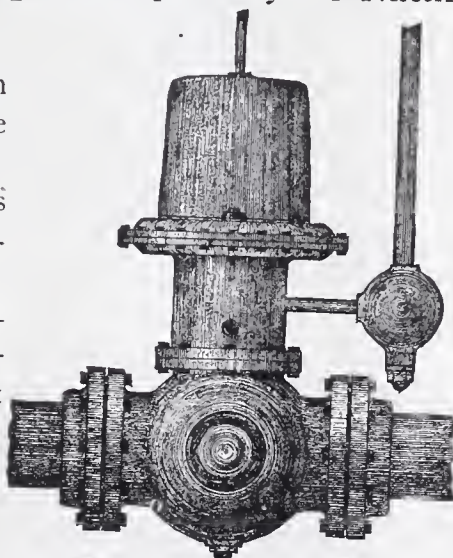
Patented Nov. 10, 1885.

We deliver 2 to 20 oz. from 25, 50 or 100lb. High Pressure Main.

We can furnish these valves with flanges suitable for connection to 3, 4 or 6-in. supply.

They are guaranteed to deliver an even flow from a variable supply; to work without pulsating.

House Valves—No. 1, 1x2 inches; No. 2, 1 1-4x2 1-2 in.



[6-IN. MILL OR STREET MACHINE.]

For full particulars, terms, etc., address,

Patented Jan. 26, 1886.

Attention is directed to our method of freeing Natural Gas from dirt or other foreign matter before passing seats of valves. The Plug shown at bottom of cut opens into inlet passage, and through this opening any dirt may be removed.

This feature will be appreciated by those using from recently completed lines.

We have two sizes, Nos. 6 and 7. Where a variation of 1-2 oz. is permissible we recommend No. 6; where it is necessary to govern with less variation, No. 7.

E. C. MERRILL & CO.,

5919 Broad Street, Pittsburgh, Pa.

W. H. DUFUR, Chairman.

JAS. B. BERRY, Secretary and Treasurer.

THE ASTRAL REFINING CO.,
LIMITED.

Refiners and Producers of Petroleum,
ALL QUALITIES OF
Illuminating, Lubricating Oils, Naphthas and Gasoline,
OIL CITY, PENN'A.

Manufacturers of "Water White Astral Oil," 48 to 49 Gravity, 50 Fire Test.

J. W. McFARLAND,

BROKER IN OIL PRODUCTION.

81 MAIN STREET.

Buys, Sells and Leases all kinds of Oil Properties. In-
formation carefully given.

ADDRESS LOCK BOX 1925, BRADFORD, PA.

JAMES C. BOYCE,

ATTORNEY AT LAW,

Solicitor of Patents and Attorney in Patent Causes.

ROOM NO. 3,

Over Oil Well Supply Company, Limited.

Corner Main and Webster streets, - - BRADFORD PA.

FOR OIL OR GAS WELL PACKERS

SEND YOUR ORDERS TO

S. R. DRESSER, BRADFORD, PA.,

Who will fill them promptly with

The Best Malleable Iron Frame and Superior Quality of Rubber.

He Makes a Specialty of the Packer Business and Can Give You

Anything in that Line.

WHEELING AND LAKE ERIE

And Cleveland and Marietta R. R's.

Time Table—In effect July 18, 1887.

Central Standard Time

EASTWARD.	No. 5.	No. 7.	No. 9*	No. 1*
Toledo.....Lv	7 45a. m.	1 00p. m.	4 50p. m.	.....
Oak Harbor.....Ar	8 41	1 53	5 45	.....
Fremont.....	9 07	2 18	6 08	.....
Clyde.....	9 24	2 34	6 23	.....
Bellevue.....	9 40	2 48	6 37	.....
Monroeville.....Lv	9 53	3 05	7 01	3 10a. m.
Norwalk.....	10 15	3 22	7 17	3 22
Wellington.....	11 05	4 13	8 08	4 03
Creston.....Ar	11 53	5 05	8 55p. m.	3 47
Orrville.....Ar	12 20p. m.	5 35	5 15a. m.	5 15*
Orrville.....Lv	12 40	5 40	7 00	7 00
Massillon.....Ar	1 20	6 20	7 42	7 42
Massillon.....Lv	1 20	6 20	7 42	7 42
Navarre.....	1 35	6 35	8 00	8 00
Valley Junction.....Lv	2 15	7 20	8 45	8 45
New Cumberland.....	2 28	7 33	9 05	9 05
Sherrodsville.....	2 40	7 45	9 25	9 25
Leesville.....	2 48	7 53	9 40	9 40
Bowerston.....Ar	2 55p. m.	8 00p. m.	9 50a. m.	9 50 a. m.
Canal Dover.....	3 42p. m.	5 52a. m.	.....	.....
Newcomertown.....	4 28	6 30	.....	.....
Cambridge.....	5 25	7 30	.....	.....
Macksburg.....	6 56	9 03	.....	.....
Marietta.....Ar	8 10p. m.	10 15a. m.	.....	.....

WESTWARD.	No. 6.	No. 8.	No. 4.	No. 2*
Marietta.....Lv	6 50a. m.	12 15p. m.	.....	.....
Macksburg.....	8 04	1 26	.....	.....
Cambridge.....	9 40	3 00	.....	.....
Newcomertown.....	10 50	4 00	.....	.....
Canal Dover.....	11 32 a. m.	4 40p. m.	.....	.....
Bowerston.....	11 25 a. m.	3 45p. m.	6 35 a. m.	.....
Leesville.....	11 32	3 55	6 43	.....
Sherrodsville.....	11 40	4 10	6 53	.....
New Cumberland.....	11 52	4 25	7 07	.....
Valley Junction.....	12 20p. m.	5 02	7 25	.....
Navarre.....	12 50	5 35	8 00	.....
Massillon.....	1 05	5 50	8 15	.....
Orrville.....Ar	1 40	6 25	8 53	.....
Orrville.....Lv	1 45	6 35*	8 58	*
Creston.....Lv	2 18	7 02	9 28	5 30a. m.
Wellington.....	3 05	7 43	10 15	6 20
Norwalk.....	3 55	8 25	11 25	7 25
Monroeville.....	4 07	8 35	11 37	7 35
Bellevue.....	4 23	9 15	11 55	7 51
Clyde.....	4 39	9 29	12 10p. m.	8 06
Fremont.....	4 55	9 45	12 28	8 23
Oak Harbor.....	5 20	.....	12 53	8 45
Toledo.....Ar	6 15p. m.	10 45*	1 50p. m.	9 40a. m.

No. 27.	No. 25.	NORWALK & HURON.	No. 26.	No. 28.
5 20p. m.	8 20 a. m.	Ar.....Huron.....Lv	9 30a. m.	6 30p. m.
5 05	8 05	.....Fries Landing.....	9 45	6 45
4 52	7 55	.....Milan.....	10 00	7 00
4 30p. m.	7 35a. m.	Lv.....Norwalk.....Ar	10 25 a. m.	7 25p. m.

* Daily.

No. 23 leaves Norwalk 6.05 a. m., arrives Milan 6.30 a. m. No. 24 leaves Milan 6.45 a. m., arrives Norwalk 7.05 a. m.

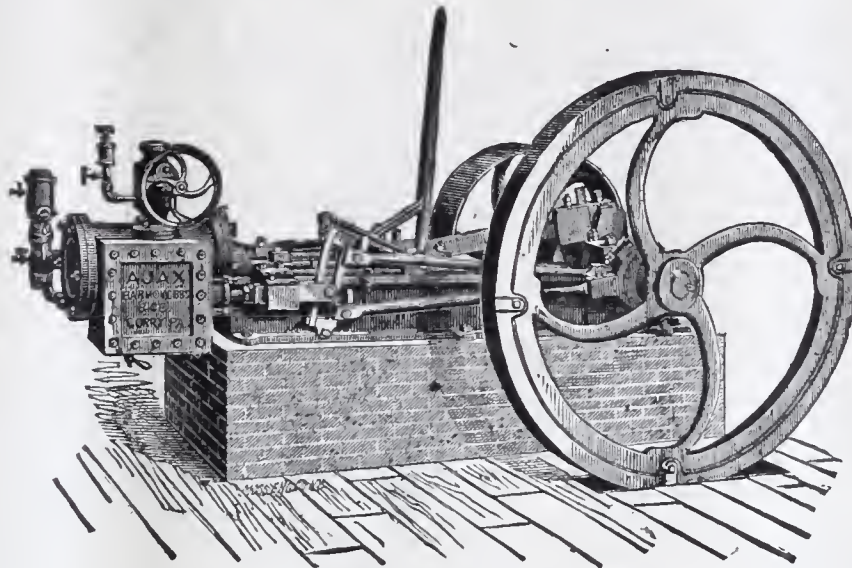
This road is now open through from Toledo to Bowerstown, connecting with the Pennsylvania System for all points East.

THROUGH CAR SERVICE—Between Toledo, Cambridge and Marietta; Toledo and Bowerstown; Toledo and Akron, Youngstown and Pittsburgh; Chicago, Akron, Youngstown and Pittsburgh.

M. D. WOODFORD,
General Manager.

JAMES M. HALL,
Gen'l. Pass. Agent

THE AJAX ENGINE,



Manufactured by Harmon, Gibbs & Co.,

Is still the favorite in every field from the 400 feet wells of Grand Valley to the 3,000 feet wells of Washington. Economy in Fuel, Strength, Power, Speed and Durability are its strong points. Nearly 2,000 now in use, and you may travel from Wellsville, N. Y., to Macksburg, O., and not find one in a junk or repair shop.

We finish them in the shop and do not have to follow them into the field to make them run. Record of "Ajax" No. 1105 over 22,000 feet and still drilling.

JAMES M. LAMBING, General Agent, Corry, Pa.

OFFICE OPPOSITE PASSENGER DEPOT.

VICK'S FLORAL GUIDE.

If you are in want of Garden, send 10 cts. can be deducted from **SEEDS** or anything for the for above, which the first order. **JAMES VICK, SEEDSMAN, ROCHESTER, N. Y.**

Buffalo, Rochester & Pittsburgh R. R.

BUFFALO AND ROCHESTER DIVISION.

May 22, 1887.

Eastern Time.

STATIONS.							
P. M.	A. M.	P. M.	A. M.	Ar.	Lv.	P. M.	A. M.
7 15	6 20	11 00	8 10	Ar. Buffalo..	Lv	5 10	7 50
3 16				" Rochester "			11 44
2 30	3 30	8 00	11 00	" Salamanca "	Ar	8 00	12 30
6 00				Lv. Bradford. Ar			
	P. M.					P. M.	P. M.
	2 15			Ar do	Lv	12 55	
	11 38			" Ridgway "		3 26	
	10 14			" Falls Creek "		4 51	
	10 08			" Dubois "		4 58	
	9 00			Punxsutawney.		5 59	
	A. M.			Lv	Ar		

Thousand Mile Tickets sold at Two Cents per mile.

Connections made at Salamanca with the N. Y., P. & O. R. R. for all points West and Southwest; also with the Erie R. R. for all Eastern points; at Bradford with the Narrow Gauge system to all points in the Oil Regions.

JAS. T. GARDNER, Sup't. I. S. EMERY, Gen. Pass. Agt.

Warren and Farnsworth Valley Railroad.

Narrow Gauge Railroad to Garfield, Vandergrift and Dunham's Mills.

	A. M.	P. M.	A. M.	P. M.	
Clarendon, Lv.....	10 35	5 10	Garfield, Lv.....	7 20	3 15
Garfield, Ar.....	11 35	6 10	Clarendon, Ar..	8 20	4 15

Trains are run on P. & E. R. R. time. Passengers can leave Oil City and Titusville for Garfield by morning train, remain three and one-half hours in Garfield and return same evening.

A. D. WOOD, General Manager.

PETROLEUM REAL ESTATE CO

C. D. ANGELL,

OFFICE: 59 MAIN ST., BRADFORD, PA.

Buy, sell and lease all kinds of Oil Lands and City Property, Negotiate Contracts and do a General Commission Business. Information carefully given. Address Lock Box 1275.

BRADFORD, BORDELL & KINZUA

AND

Bradford, Eldred & Cuba Railroad.

May 29, 1887.

WEST.		STATIONS.		EAST.		
Exp.	Mail.			Exp.	Mail.	
P. M.	A. M.			A. M.	P. M.	
5 20	11 50	Ar	Bradford	Lv	7 25	2 25
4 45	11 15	"	Kinzua Junction	"	8 05	3 05
4 38	11 10	"	McCalmont	"	8 10	3 10
4 36	11 08	"	Rew City	"	8 13	3 13
4 13	10 48	"	Rixford	"	8 31	3 28
4 08	10 43	"	Duke Centre	"	8 36	3 33
3 50	10 25	"	Eldred	"	8 55	3 50
3 32	10 10	"	Bullis Mills	"	9 10	4 05
3 17	9 54	"	Ceres	"	9 26	4 21
3 04	9 40	"	Little Genesee	"	9 40	4 35
2 55	9 30	"	Bolivar	"	9 50	4 45
2 34	9 06	"	Allentown	"	10 14	5 09
2 05	8 35	Lv	Wellsville	Ar	10 15	5 40
P. M.	A. M.			A. M.	P. M.	
7 30	10 45	Ar	Bradford	Lv	8 30	5 15
6 55	10 10	"	Kinzua Junction	"	9 10	5 55
6 47	10 02	"	Aiken	"	9 17	6 02
6 41	9 56	"	Davis	"	9 23	6 08
6 35	9 50	"	Simpson	"	9 30	6 15
6 25	9 40	"	Ormsby	"	9 40	6 25
5 50	9 03	"	Smethport	"	10 15	7 00
5 50	9 05	"	Mt. Jewett	"	10 15	7 00
5 15	8 30	Lv	Kane	Ar	10 50	7 35

Sunday Train leaves Smethport at 8:25 a. m., arriving at Bradford at 10 a. m. Returning leaves Bradford at 3:30 p. m. arriving at Smethport at 5:10 p. m.

JOHN C. MCKENNA, Superintendent.

Philadelphia & Erie Railroad.

Time Table in Effect Nov. 15, 1886. | Eastern Standard Time.

EASTWARD.		Kane Express No. 18.	Day Express No. 8.	Erie Mail No. 4.	Kane Accom. No. 12.
Erie	Lv.	7 35 a m		2 45 p m	5 25 p m
Corry	"	9 00 "		4 13 "	6 55 "
Irvinton	"	9 50 "		5 00 "	7 50 "
Warren	"	10 05 "		5 15 "	8 05 "
Kane	Ar.	11 25 "		6 30 "	9 15 "
Kane	Lv.		6 25 a m	6 55 "	
Johnsonburg	"		6 58 "	7 30 "	
Emporium Junction	"		8 30 "	9 15 "	
Lock Haven	"		11 15 "	11 58 "	
Williamsport	"		12 20 p m	1 25 a m	
Harrisburg	Ar.		3 13 "	4 30 "	
Philadelphia	"		6 50 "	8 25 "	
WESTWARD.		Erie Accom. No. 11.	Erie Mail No. 3.	Niagara Express No. 11.	Erie Express No. 17.
Philadelphia	Lv.		11 25 p m	7 40 a m	
Harrisburg	"		3 30 a m	11 25 "	
Williamsport	"		7 10 "	2 25 p m	
Lock Haven	"		7 58 "	3 15 "	
Emporium Junction	"		10 30 "	6 25 "	
Johnsonburg	"		12 00 m	8 02 "	
Kane	Ar.		12 40 p m	8 35 "	
Kane	Lv.	6 35 a m	1 00 "		4 10 p m
Warren	"	7 45 "	1 58 "		5 25 "
Irvinton	"	7 58 "	2 09 "		5 45 "
Corry	"	8 55 "	2 56 "		6 45 "
Erie	Ar.	10 10 "	4 00 "		8 05 "

Trains daily except Sunday.

THROUGH-CAR ARRANGEMENT WESTWARD—Erie Mail—Pullman Palace Sleeping Cars Philadelphia to Erie, and Philadelphia to Williamsport (cars open to receive passengers at Philadelphia at 10 00 p m), and Washington to Williamsport. Passenger Coaches from Philadelphia to Erie, and Baltimore to Williamsport.

Niagara Express—Pullman Parlor Car Philadelphia to Williamsport.

THROUGH-CAR ARRANGEMENT EASTWARD—Day Express—Pullman Parlor Car Williamsport to Philadelphia. Passenger Coaches Kane to Philadelphia, and from Williamsport to Baltimore.

Erie Mail—Pullman Sleeper Erie to Philadelphia, and Williamsport to Philadelphia. (Car open to receive passengers at Williamsport at 9 00 p m.) Passenger Coaches Erie to Philadelphia, and Williamsport to Baltimore. Sleeping Car Williamsport to Washington.

W. & W. R. R. TIME TABLE.

DECEMBER 27, 1886.

NORTHWARD		STATIONS.	SOUTHWARD	
No. 3	No. 1		No. 2	No. 4
P. M.	A. M.		A. M.	P. M.
2 00	6 00	Lv. Wayneburg	10 35	6 25
2 15	6 15	Sycamore	10 17	6 07
2 23	6 23	Swart	10 09	5 59
2 30	6 30	Deer Lick	10 02	5 52
2 38	6 38	West Union	9 53	5 43
2 47	6 47	Dunn	9 43	5 33
2 50	6 50	Lindley's Mills	9 40	5 30
3 01	7 02	West Amity	9 28	5 18
3 06	7 08	Luellen	9 22	5 12
3 11	7 13	Baker	9 17	5 07
3 14	7 20	McCracken	9 13	5 00
3 27	7 35	Vankirk	9 00	4 47
3 40	7 50	Braddock	8 48	4 33
3 55	8 05	Ar. Washington	8 35	4 20
6 36	9 55	Ar. Pittsburgh	6 10	1 55
P. C. & St. L. R. R.				

Time given above is Central Standard, which is 40 minutes slower than Pittsburg or local time, or one hour slower than Eastern time.

The Company reserve the right to vary from this schedule as circumstances may require. All trains daily except Sunday.

C. E. BOWER, Superintendent.

JOHN F. STRATTON,

49 Maiden Lane,

New York.



Importer, Manufacturer and Wholesale Dealer in all kinds of Musical Merchandise, Musical Boxes, Band Instruments. Stratton's Celebrated Russian Gut Violin Strings.

FRANK B. CONVERSE



BANJO.

The PITTSBURG & WESTERN RAILROAD Time Table

NORTHERN DIVISION.

SOUTHBOUND TRAINS.

STATIONS.		27		17	
		P. M.	A. M.	A. M.	
Bradford	Lv.			6 00	
Mt. Jewett	Lv.			7 40	
Kane				10 10	
Sheffield Junction				11 04	19
Marienville				11 47	P. M.
Tylersburg				12 27	
Clarion Junction			6 20	1 14	4 00
Clarion			6 30	1 28	4 14
Shippensburg			6 45	1 45	4 33
Knox			7 24	2 30	5 20
St. Petersburg			7 38	3 00	5 40
Foxburg		23			
Parker			6 50	3 10	
Bruin			6 08	3 31	P. M.
Perolia			6 18	3 45	
Karns			6 22	3 50	9
Millerstown			6 36	4 07	
St. Joe			6 50	4 25	P. M.
Butler			7 18	5 25	1 55
Renfrew			7 39	5 45	2 11
Callery Junction			8 05	6 05	2 35
Allegheny	Ar.		9 30	7 20	3 58
		A. M.	A. M.	P. M.	P. M.

NORTHBOUND TRAINS.

STATIONS.		28	8	18	24	26
		A. M.	A. M.	A. M.	P. M.	P. M.
Allegheny	Lv.	3 15	9 20	7 20	12 40	5 35
Callery Junction		4 40	10 40	8 35	1 50	6 50
Renfrew		5 02	11 00	8 55	2 13	7 12
Butler		5 20	11 20	9 18	2 36	7 30
St. Joe				9 45	3 08	8 00
Millerstown			A. M.	10 30	3 23	8 14
Karns				10 15	3 33	8 28
Petrolia			20	10 20	3 45	8 32
Bruin				10 32	3 56	8 43
Parker			A. M.	10 52	4 15	9 00
Foxburg			6 2	11 25	4 40	9 10
St. Petersburg			6 44	11 41	4 54	
Knox			7 49	12 32	5 40	
Shippensburg			8 11	12 53	5 58	
Clarion Junction			8 39	1 14	6 10	
Clarion			9 00	1 45	6 40	
Tylersburg				1 48		
Marienville				2 26		
Sheffield Junction				3 06		
Kane	Ar.			3 58		
				4 40		
Bradford	Ar.			6 35		
		A. M.		P. M.	P. M.	P. M.

Westbound trains leave Callery Junction as follows:

Cleveland and Toledo Express 8.35 a. m., New Castle Accommodation 4.43 p. m., Chicago Express, with through Sleeping Car. 1.44 p. m., Zelenople Accommodation 6.55 p. m.

No. 17 makes direct connection at Allegheny with B. & O. R. for Washington and Baltimore.

No. 19 connects at Foxburg with A. V. R. R. for Franklin and Oil City.

SUNDAY TRAINS Nos. 23 and 26 will run daily. Nos. 18 and 17 will run daily between Butler and Allegheny. No. 23 connects at Callery Junction for Allegheny and New Castle. No. 26 gets connections from Allegheny and New Castle. All other trains run daily, except Sunday.

THOS. M. KING, General Manager.

C. W. BASSETT, General Passenger Agent.

DUNKIRK, ALLEGHENY VALLEY & PITTSBURGH R.R.

Going North.		Express No. 2.	Mail No. 4.	Sunday No. 6.
Titusville, leave		7 35 a. m.	3 20 p. m.	7 35 a. m.
Grand Valley		8 03 a. m.	3 48 p. m.	8 01 a. m.
Irvinton		8 45 a. m.	4 36 p. m.	8 44 a. m.
Warren		8 58 a. m.	4 53 p. m.	8 56 a. m.
Junction		9 55 a. m.	5 45 p. m.	9 48 a. m.
Lily Dale		10 50 a. m.	6 36 p. m.	10 37 a. m.
Dunkirk, arrive		11 25 a. m.	7 10 p. m.	11 12 a. m.
Going South.		Mail No. 1.	Express No. 3.	Sunday No. 5.
Dunkirk, leave		9 25 a. m.	4 00 p. m.	2 40 p. m.
Lily Dale		10 03 a. m.	4 38 p. m.	3 14 p. m.
Junction		11 02 a. m.	5 45 p. m.	4 08 p. m.
Warren		11 55 a. m.	6 44 p. m.	5 06 p. m.
Irvinton		12 10 a. m.	7 00 p. m.	5 22 p. m.
Grand Valley		12 58 p. m.	7 49 p. m.	6 12 p. m.
Titusville, Ar.		1 20 p. m.	8 15 p. m.	6 40 p. m.

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OIL BELTS IN WYOMING.

BY PROF. S. AUGHEY, PH. D., L.L. D.

SEVERAL conspicuous oil belts occur in Wyoming. The most extensive lies east of the Wind River and north of the Rattlesnake Mountains. It commences at Fort Washakie on the west and extends eastward to the big bend in the Platte River, or from Range 81 to 101 west, a distance of 126 miles; and in Townships 30, 31, 32 and 33 north. Along this line oil occurs at intervals and in basins, but the oil phenomena that appear at the surface run approximately in a northwesterly and southeasterly direction.

Commencing on the west the first important oil springs occur at Fort Washakie, on the Shoshone Indian reservation. Southeast from Washakie, 25 miles on the Little Papoia River, are the Shoshone oil springs and wells. Here, over an area of from 60 to 80 acres in a narrow valley worn down on an anticlinal fold, are an immense number of oil escapes and a large quantity of hardened oil from 3 inches to 3 feet thick. A bog originally existed here filled with mud, water and oil. This was drained by straightening the channel of the river, putting a dam across each end of the old bed and using it as a reservoir for the oil. The first well put down here 12 feet deep had a hole bored in the center 27 feet deeper, which produced before the hole filled up 10 barrels a day. The Omaha Oil and Transportation Co. have since bored 2 wells. The one bored in February last to a depth of 90 feet produces about 80 barrels of oil per day. Another bored the early part of this season over 300 feet deep produces over 300 barrels per 24 hours. The entire yield at this point, at present, from springs and wells cannot be less than 1000 barrels per day.

By the windings of the road 40 miles east of the Shoshone the Beaver oil basin occurs. The oil here escapes in a number of springs. It emerges in and around a cove which is the centre of an anticlinal uplift. Here a shallow well full of water is constantly boiling from the escape of gas. A large quantity of hardened oil in places covers the surface, and the rocks around are saturated with petroleum. The boring commenced here in the spring will early be resumed. Thirty miles east of this point in Ranges 90 and 91 west there is another area of oil springs, and the territory occupied by them is, like that at Shoshone, covered by hardened oil cake, which ranges from a few inches to many feet in thickness. Still further east along the north side of the Rattlesnake Mountains and around their west end is an extensive oil territory. The hogbacks here are saturated with oil, and in Townships 87, 88 and 89 are numerous oil springs and oil escapes. This region here is known as the Big Horn and Rattlesnake oil basins. The Arago oil basin in Township 86 extends southeasterly across the Rattlesnake range, and is also characterized by oil springs and oil escapes and hardened oil. The next important basin eastward is Seminole Mountain and the territory adja-

cent. Here in Townships 81, 82 and 83 west are large areas of oil-saturated rocks and hardened oil and a few oil springs. The territory covered by this oil belt cannot be less than 1500 square miles. This belt probably extends further east, but my detailed examinations were not sufficiently exact to justify a definite statement as to that point.

Another oil belt exists further north, the centre of which apparently exists in Township 41 north, of Range 81 west, on the east side of South Powder River and opposite to the mouth of Willow Creek. Here I found 5 oil springs and a large number of oil escapes. The rocks are much saturated in places with oil and the oil escapes and springs occur along an anticlinal fold. Here boring was commenced in April, but from various causes was interrupted, but at this writing is about to be resumed. Northwest from this point, in Township 40 north and 82 west, oil also occurs; also in Township 40 north, of Range 79 west on Salt Creek. Here 3 oil springs, at least are known which emerge along the line of an eroded gentle anticlinal fold. Oil is also known to exist on the Belle Fourche, and on the line of the Union Pacific Railway east of Evanston, but these two latter localities I have not sufficiently studied to venture a description.

Geological Age.—It is somewhat remarkable that while in the East oil occurs in the Palæozoic rocks, in Wyoming it occurs in the Mesozoic, and in California in the Cenozoic. The geological conditions under which oil was formed in Wyoming occurred countless centuries after the Pennsylvania petroleum rock was laid down.

While it is clear that the Wyoming oils occur and originated in the Mesozoic, it is not so evident in what epoch of this age, whether Triassic, Jurassic or Cretaceous. From a careful survey of the field, carried on at intervals through many years, I have become satisfied that the preponderance of evidence is in favor of the theory that the real source of the Wyoming oils are the red Triassic rocks. At Washakie the oil emerges from the Triassic rocks; also at the Shoshone, and in the southern part of the Powder River oil basin. Wherever the oil springs occur in rocks of Cretaceous age, the strata are more or less broken, or faulted, or both, and the conditions exist that make it possible for the petroleum to come from the Triassic beneath. It is also clear that the oil cannot come from rocks older than the Triassic.

At the Shoshone oil basin where the anticlinal fold of the Triassic is worn down 1000 feet, the oil emerges from the lowest exposed stratum, or from about the middle of these deposits. Following the Papoia southward through a canyon 1500 deep, I studied the Terraines beneath the Triassic measures until they terminated in the Archæan rocks. In this way I passed through successively the Permian, Carboniferous and Silurian strata. At no point beneath the Triassic rocks were there any indications of oil except at one place. In the middle or near the middle of the Silurian series a layer of rock 16 inches thick contained a little asphalt, but this layer was

wanting elsewhere in the oil belt along the north side of the Rattlesnake Mountains. As it occurs beneath a great thickness of silicious limestone, it cannot be the source of the Shoshone oil. The borings, too, at Shoshone from which the large oil flows come are toward the middle of the lower half of the Triassic sandstones.

At the Beaver oil basin the oil springs occur in the upper Cretaceous (Fox Hills) sandstone. Here the anticlinal fold is more or less fractured and faulted, and the borings failed to reach the seat of the oil for the probable reason that they were not extended to the Triassic sandstones.

The oil springs eastward from the Beaver occur in the Colorado group (Fort Benton and Niobrara of Meek and Hayden) and the Dakota group of the Cretaceous. In the Rattlesnake basin the oil is dense and heavy, and occurs in the brownish sandstones of the Dakota group. Borings have been made here by a Denver company and by the Central Association of Wyoming, into the Cretaceous to a depth of 1000 feet, and although oil and gas were encountered no flow was obtained, but in no case did they go deep enough to reach the Triassic rocks. Boring here has been resumed and the question of the oil source in this basin will be ascertained at an early day. At the Seminole Mountain the oil flow comes from the Fox Hills Cretaceous, but a well put down here to a depth of 12 feet, at a point where a canyon cuts through this group, and through the underlying shales, struck the Dakota group of brownish sandstones, and a flow of 1 barrel per day was obtained.

On the Powder River the oil flow in the northern part of the basin is from the Dakota group of brownish sandstones. In the southern part of the basin, as already stated, the Triassic red sandstones are exposed and from these oil issues at the top of the series. Where the oil escapes from the Dakota group in this basin, along the axis of the anticlinal fold, the strata are faulted and the evidence is clear that the petroleum comes from some depth or reservoir beneath, and most probably from the Triassic rocks. A boring made here through the Dakota group into the Jurassic marls failed to obtain a flow of petroleum, although a large amount of gas and some oil was encountered. Boring here is about to be resumed in order to penetrate the Triassic sandstones.

On Salt Creek, 13 miles southeastward from the Powder River oil basin, the petroleum comes up vertically along an anticlinal axis, through the Fort Benton shales. If our theory is correct, the distance to be bored here before reaching the source of the oil is from 1200 to 1500 feet. While the evidence does not therefore amount to absolute demonstration that the source of all the Wyoming oils is the Triassic formation, the preponderance of proof lies in that direction. The sandstones of the Triassic shade from fine to coarse, and the latter, especially towards the base, pass into fine and then into coarse conglomerates. They are invariably soft in the oil basins. The basal member of the Dakota group is also a conglomerate, becoming finer gradually, and finally merging into sandstone.

During the progress of the Triassic age, the Wind River and Rattlesnake Mountains were an oceanic shore line. In fact, all the oil basins of Wyoming occur near to and along the ancient Triassic shore lines. The Triassic sandstones in this region are shallow water deposits. South of the Shoshone in the deep canyons the sandstones are fissile, and even where 2500 feet thick show ripple marks in every stratum and layer. The plunge and flow structure is also common, and other evidences of an off-shore deposit. The explanation evidently is,

that during the countless centuries when these rocks were in process of deposition the sea bottom was gradually subsiding, and the subsidence was about as rapid as the filling up, thus keeping the water continually shallow. These points are important because they show that the Wyoming oil belt was formed under conditions somewhat similar to those that prevailed during the Devonian age, when the Eastern petroleum rocks were laid down. According to Carll, the Eastern oil fields are all off-shore deposits and were formed on a gradually subsiding sea bottom.

QUALITY AND QUANTITY.

There is an almost infinite variety in the petroleum of the world. The eastern oil field is remarkable for the large quantity and high grade of its illuminating oils. The Wyoming petroleum field is equally remarkable for the superior quality of its lubricating oils.

Beginning our discussion with the extreme western basin on the Papoiaie, the oil here known locally as the Shoshone is distinguished for its extremely black color, which is inseparable by any known process except by the results of distillation. In its crude state as it flows from the wells it has a gravity of 20 in the Baume scale; its flash test is 294° F; fire test, 322°; and cold test 16° below zero. By distillation the following is obtained:

Naphtha, 0.63; kerosene, with a fire test of 159°, 47.00; lubricating oil, neutral and light colored, 32.00; coke, 12.00.

From the above it will be seen that it could be utilized either for kerosene or lubricating oil, or for both. Though not as finely constituted for lubricating oils as some to be noticed hereafter, the amount of kerosene makes it important and valuable.

By the method of fractional distillation practiced by Messrs. Wyner and Harland, public analysts of London, England, 68 per cent. of lubricating oil was obtained by them. They further remark that "the above results prove this to be an exceedingly valuable oil for the production of kerosene, and a superior lubricating oil." In its crude state this oil was for some time used to lubricate the car wheels of the Union Pacific Railway and proved eminently satisfactory. Its use was discontinued, not from any defect in quality or cost, but for other reasons.

By tests made at the Stephens Institute of Technology, at Hoboken, New Jersey, this oil was found to be singularly free from the common defect of gumming. A part of this superiority comes from the entire absence of paraffine. The absence of paraffine produces no instability, as is the case with some other oils. One bottle of it in my guardianship for four years, and left uncorked for that length of time, exhibited no change that could be detected by physical or chemical tests. No change, except a slight decrease in odor and increase in gravity was observed in the petroleum left standing in the reservoirs at Shoshone after three years.

Very different from the Shoshone oil is the petroleum from the Beaver basin, eastward from the above. The oil here has a gravity of 14½° Baume. The color resembles dark mahogany, and the odor when the oil first emerges resembles a cross between linseed and balsam. Oil experts universally say that it has all the necessary characteristics of a superior lubricant. Even without manipulation it acts better than the majority of cylinder oils. Cheap and easy methods of manipulation can, however, be devised to change it into such forms as might be the most useful. For common use on engines, etc., it would be more acceptable, owing to its high spe-

cific gravity ($14\frac{1}{2}$ Baume), if mixed with one-third Seminole oil, whose gravity is 32° Baume. (This latter oil will be discussed presently). By this and other simple methods the best of lubricators could be obtained for any kind of simple or complicated machinery.

Concerning the quality of the Beaver oil, H. K. Taylor, Esq., a chemist of the Standard Oil Company, in answer to questions by Dr. Geo. B. Graff, thus wrote; * * "The Beaver is the best natural oil for cylinder stock that I ever saw. It has a margin of 10 to 12 degrees of gravity over the best cylinder stock made in the east." The determination of Mr. Taylor has been fully confirmed by Messrs. Wyner and Harland, who sum up their analysis by the statement that "When properly treated by distillation the products obtained would form lubricating oils equal, if not superior, to the best vegetable or animal lubricants."

The oils from the great basin in Townships 32 and 33 north, of Ranges 89 and 90 west, have been submitted to me, but I have not yet studied them. In physical characters, however, they bear a close resemblance to the oil from the Beaver basin.

The oil from the Big Horn oil basin north and northwest from the west end of Rattlesnake Mountain is light and thin, though much denser than the Pennsylvania or Ohio crude petroleum. When it first emerges it is of a greenish hue, but soon changes to a mahogany color. Its odor is pleasant, balsam-like, and approximates in general character closely to the Beaver oil, the superiority of which over all other oils as a lubricant has already been stated. An explanation of the similarity of these oils may be found in the fact that they both flow from the Fox Hills sand rock and the filtering to which they have been subjected on their passage from the red Triassic sandstones beneath. The amount of kerosene in this oil has not yet been ascertained, but its physical appearance being so much like that of the Beaver classes it at once among the superior lubricants.

The petroleum of the Rattlesnake basin is unique in character. Its gravity is only slightly less than water, or near zero in the Baume scale. It burns only at a very high temperature. Physical and chemical tests have failed to detect any paraffine in it. The color is mahogany black. When standing for some time it becomes jelly-like in consistency. Its pungent and petroleum-like odor is lost on exposure. Wyner and Harland, the public analysts of London, thus sum up the results of their analyses of this oil:

"This oil is valuable on account of the hydrocarbon which can be obtained from it by destructive distillation, by far the most important being the heavy lubricating oil of specific gravity of 950. This oil distills at a very high temperature, considerably above the range of a mercurial thermometer, and this, taken in conjunction with its high specific gravity, should render it an exceedingly valuable lubricant for heavy machinery. It is not altered and shows no sign of solidifying when subjected to many degrees below zero, Centigrade."

Closely related to the Rattlesnake oil is that of the Arago basin, a few miles further east. It has a higher specific gravity than any oil yet found in Wyoming. It is below zero in the Baume scale, or over 1000, and of course sinks in water. It is very dense, of a dark mahogany color, and can be cut with a knife like soft butter. It gradually turns black on exposure. It has little odor as it comes out of the shaft, though what escapes from the face of the escarpment has slightly more pungency, which, however, it loses on exposure. It has a very high fire test, and burns only at a high temperature. It contains no paraffine and does not solidify at any ordinary cold below zero. Though too thick for ordinary

lubricants, it can be manipulated by combining it with lighter oil so as to make it of great value. It can be brought to any required consistency either by combining it with the Big Horn or Seminole oils.

In a southeasterly direction from the above, and on the southern slope of the Rattlesnake Mountains, oil occurs of much less gravity and darker color, but it has not yet been sufficiently studied to give its characters in more detail.

The Seminole oil, near the big bend of the Platte River, is the lightest of the Wyoming oils. Its gravity is between 31.50 and 32 degrees Baume. It is of an amber or light green color. It contains no paraffine, and its flash and fire test are both high. It yields a considerable amount of kerosene. It is a good lubricating oil, and has the property of liquifying the heavy Rattlesnake oils, by which admixture any grade of lubricating petroleum can be produced. One-fourth of this oil combined with three-fourths of the heavy Rattlesnake oil makes a mixture that could readily be piped to any desired distance.

The extensive oil field on the South Powder River, in Townships 40 and 41 north, of Range 81 west, is approximately uniform in the character of its oils, but differing considerably from any heretofore noticed. They vary only from 21 to 22 degrees Baume, coming nearest in all respects to the Beaver oils. When the oil first emerges it has a slightly greenish hue, which soon changes to a mahogany, and then to a black color. These oils are superior even to the Mecca oils in lubricating purposes. They can readily be decolorized and light-colored lubricants of the highest grade manufactured from them.

The specific gravity of the Salt Creek oils (13 miles southeast of the preceding) is about 25 degrees Baume, or slightly greater than that of Powder River. At first it is of a slightly greenish hue, but like that on Powder River, exposure changes it to a blackish color. The slightest examination, such as rubbing it on glazed paper, shows it to belong, like the preceding, to the lubricating series. Of all the fine oils of Wyoming I regard this, if not the finest, at least as fine as there is anywhere, not excepting the famous Beaver oil. It will prove itself to be one of the ideally perfect lubricating oils of the globe.

Thus it will be seen that the petroleum of Wyoming vary in gravity from below zero to 32 degrees of the Baume scale. This disproves what has sometimes been held, namely, that the oils along this belt have an underground connection. In that case they would necessarily be much more uniform in character. There are still other varieties of these oils, but they do not differ enough from the main types already given to justify a separate description.

But does oil exist in sufficient quantities to justify the construction of pipe lines for its transportation? We have already shown in this article that the oil area of Wyoming covers a larger territory than that of Pennsylvania. At only one point, however, have the borings been extended to the source of the oil, namely, at the Shoshone basin. There three borings and a few shallow wells produce 1500 barrels daily. The oil showing at the surface at a number of other places, such as the basin west of the Rattlesnake, the Beaver, the Rattlesnake proper, Arago, Seminole, Powder River and Salt Creek is in some of them equal to that at the Shoshone. And there is no reason to doubt that if the borings at these places are, like those at the Shoshone, extended deep into the red Triassic rocks (the source of the oil) the production will be equally great. It is also extremely probable that at many points along this belt, where now no oil shows itself at the surface, it will be found by future borings. It cannot, therefore, be long before

capital will be justified in investing in pipe lines to transport these oils to centres of distribution. The Wyoming Central Railway has just been organized and grading commenced for a continuation of the Nebraska line westwardly to and along the line of the Platte, which road will tap the oil territory at its eastern end.—*Mining Review*.

OIL REGION CHRONOLOGY.

FOR AUGUST, 1887.

August 1.—AGE oil report shows 162 wells completed in July, of which 35 are dry; new production, 2093 barrels; new rigs, 66; old rigs, 108; wells drilling, 143; total field operations, 317; increase over June, 4. Three wells were completed in the Macksburg field in July, 1 of which was dry. Lima reports 10 wells completed in July, Findlay 5 and North Baltimore 7, total of 22. Thirteen wells drilling and 32 rigs up and building in Ohio fields. Market opened at 58¼c, fell off to 58c, advanced to 58¾c, receded to 57¾c, rallied to 59½c, weakened and closed at 57¾c bid. Carrying rates—New York, 25@35c; Oil City, 32½c; Pittsburgh, 35@40c; Bradford, 37½c. Meeting of the leading oil producers at the St. James, Bradford.

August 2.—Market opened at 57¾c, receded to 57¾c, reacted to 58½c, weakened to 56½c and closed at 57c. Carrying rates, 30@35c. Washington—Martin No. 4, 90 barrels an hour. Oil producers of Northwestern Ohio hold an important meeting at Findlay, Ohio. Secret session of the Producers' Protective Association held at Bradford. Bradford filled with oil men from all parts of the country, who earnestly discuss means of bettering the condition of the oil trade, but agree on no feasible plan of action.

August 3.—Market opened at 56¾c, firmed up to 57c, fell off to 56¾c, advanced to 57¾c with many fluctuations and closed at 57½c bid. Washington—Martin No. 4 doing 90 barrels an hour. Blayne No. 3, Taylorstown, in sand and starts at 90 barrels a day. Death of Pardon Worsley, "the Union spy of the Shenandoah," at Foster Brook Park. The Producers' Protective Association, after two days' session, adjourned.

August 4.—Market opened 57½c, advanced to 58½c, declined to 57¾c, reacted to 58, fell off to 57½c and closed at 57¼c. Carrying rates, 25@35c. Washington—Martin No. 4, 85 barrels an hour. Noble No. 2, Taylorstown, makes 34 barrels first 5 hours and then increases to 12 barrels an hour. George Kemerer, of Titusville, aged 16, drowned in Canadohta Lake. Bradford Co. C starts for encampment at Mt. Gretna.

August 5.—Market opened at 57¼c, advanced to 57½c, receded to 57½c and closed at 57¾c. Business very quiet. Washington—Noble No. 2 at Taylorstown gauged 180 barrels first 24 hours. Hart Bros., Blayne No. 3, good for 90 barrels a day. A well at Shamburg struck by lightning and a small tank of oil burned. Terrific storm rages at Oil City. Wm. Klingler knocked senseless by lightning. A 5000-barrel tank struck by lightning and burned near Rouseville. Two thousand barrels of oil destroyed. A 15,000-barrel tank at the Eclipse refinery, Franklin, struck by lightning and burned. Loss \$8000. Two men struck by lightning at Corry and one killed.

August 6.—Market opened at 57½c with sales at 57¾c, moved up to 57¾c, declined to 57¾c and closed at 57½c bid. Business very quiet. Washington gauge, 8435 barrels from 198 wells. Martin No. 4 made 1992 barrels the past 24 hours. The 12 wells at Taylorstown, included with Washington gauge, are doing 1324 barrels a day.

Reibold field gauge, 4236 barrels from 78 wells. Davis No. 6 starts flowing at 25 barrels an hour from the Gantz sand. Central No. 4, on the Martin farm, filled up 1800 feet and made one flow. James N. Anderson instantly killed at Titusville while attempting to stop a horse and buggy. Natural gas causes a fire at Gusher City, Cooper tract, and destroys St. Petersburg House and several other buildings. Loss, \$7000. Two women severely burned.

August 7.—Sunday. Sadie Foster, of Warren, dies from an overdose of arsenic taken to improve her complexion.

August 8.—Market opened at 57½, rallied to 57½ and closed at 57¼. Fluctuations small and trading very dull. Washington—Citizen's Oil and Gas Co.'s well on Weaver tract, southwest of the borough, spraying considerable oil from the "fifty-foot;" Martin No. 4, 85 barrels an hour; Davis No. 6, 12 barrels an hour. Two tanks of the Pittsburgh pipe lines burned at Renfrew, Butler Co. Mr. Jackson robbed on the public road near the Munce farm, Washington, of \$15. William Samson and James Herron suffocated by natural gas at Allegheny City, while repairing a regulator on the Chartiers Natural Gas Co.'s line.

August 9.—Market opened at 57¼, with quite active trading, advanced to 57½, reacted to 57¼, and in the afternoon made an unexpected advance to 58½, fell off to 58½, rallied to 59¼, and closed at 58½. Washington—Citizens' well, Weaver tract, proves a small affair and will be drilled to the Gordon sand; Central Oil Co.'s No. 4 on the M. Martin farm through sand with hole full of oil, but does not flow. An unknown tramp killed by train 12 on the B. B. & K. R. R., near Smethport. Several small burglaries at Oil City. Death of Edward M. Bredin, at Butler, the oldest member of the Butler county bar.

August 10.—Market opened firm at 59½, moved back to 58¾, rallied to 59½, and closed at 59c. Washington—Martin No. 4, 85 barrels an hour; Hodgins farm well, Taylorstown, starts at 12 barrels an hour. Citizens well on Weaver tract (called Gantz No. 2) spraying 20 barrels a day.

August 11.—Market opened at 59c, sold off to 58¾c, rallied to 59¾c and closed at 59½c bid. Carrying rates 30c@35c. Washington—Martin No. 5 (formerly called No. 4) increased to 90 barrels an hour by deeper drilling; Hodgen's well, Taylorstown, did 140 barrels first 19 hours.

August 12.—Market opened at 59¾c, advanced steadily and closed at 60¼c. Washington—Martin No. 5, 90 barrels an hour; Hodgen's well, Taylorstown, made 150 barrels last 24 hours. Rock Glycerine Co.'s factory, near Custer City, catches fire and blows up. No one injured. P. C. Boyle, of the Oil City *Derrick*, takes the Bradford *Era* in hand.

August 13.—Market opened 60¾c, advanced with few reactions to 62½c, sold off to 62c; at 2:30 weakened to 61½c, and closed at 61¼c bid. Washington field gauges 8710 barrels from 201 wells. McKeown's Martin No. 6, 1200 feet north of No. 5, strikes sand; Martin No. 5 gauges 2040 barrels last 24 hours. Taylorstown production (included with Washington gauge) 1408 barrels from 13 wells; Reibold field 4448 barrels from 78 wells. Behm No. 6 increased to 500 barrels by deeper drilling in the "100 foot." Harry R. Small, of Cooperstown, killed by jumping from a train at Clarendon.

August 14.—Sunday.

August 15.—Market opened at 61½c, rallied to 61¾c, weakened off rapidly to 60½c, and closed at 60½c.

Washington—Martin No. 5, 80 barrels an hour. No. 6 on top sand. Work commenced on the independent pipe line in the Washington field, John G. Ruple surveys a route from Johnson's station to the Ohio river.

August 16.—Market opened at 60 $\frac{5}{8}$ c, rallied to 61c, sold off to 60 $\frac{1}{2}$ c, advanced to 62 $\frac{1}{2}$ c, and closed at 61 $\frac{1}{8}$ c. Washington—McKeown's Martin No. 6 starts at 28 barrels an hour from the first pay streak; No. 5 increased to 90 barrels an hour. M. Geary purchases the Collins House, Oil City.

August 17.—Market opened at 61 $\frac{1}{4}$ c, advanced slowly to 61 $\frac{3}{8}$ c, broke to 61 $\frac{1}{8}$ c, rallied to 61 $\frac{3}{8}$ c, and closed at 61 $\frac{3}{8}$ c bid. Washington—McKeown's Martin No. 5, 85 barrels an hour; No. 6, 15 barrels an hour from bottom of Gantz sand. Mrs. Ella Dinsmore placed on trial for the murder of J. C. Davis, at Clarion. John Weisenberg, an escaped convict, captured by Deputy Sheriff Clark, near Derrick City; the officer shoots him in the back while making the capture.

August 18.—Market opened at 60 $\frac{3}{4}$ c, advanced to 61 $\frac{3}{8}$ c, settled off to 61c, rallied to 61 $\frac{3}{8}$ c and closed at 61 $\frac{1}{4}$ c. Washington—McKeown's Martin No. 5, 85 barrels an hour; No. 6, 10 barrels an hour. Chartiers Oil Co.'s No. 5 on the Fergus started at 100 barrels and in the evening was doing 140 barrels an hour. E. C. Terrell, a well-known lumberman of Clarion county, dropped dead of heart disease at Tionesta.

August 19.—Market opened at 60 $\frac{1}{4}$ c; rallied to 60 $\frac{3}{8}$ c, sold off to 58 $\frac{7}{8}$ c and closed at 58 $\frac{7}{8}$ c. Washington—Fergus No. 6, 125 barrels; Martin No. 5, 85 barrels an hour. McKeown's, Martin, No. 7 made a heavy flow at 2 a. m. which ignited from the boiler and fired the derrick. David McCain, contractor, and three other men badly burned. Well flowing by heads at 15 or 20 barrels an hour. Marshall Oil Co.'s No. 2, Carrothers farm, Taylorstown, doing 80 barrels a day. Solar No. 21, at Shanopin, shot and increased to 38 barrels an hour.

August 20.—Market opened at 59 $\frac{1}{8}$ c, rallied slowly to 59 $\frac{1}{2}$ c, sagged off to 59 $\frac{1}{4}$ c and closed at 59 $\frac{1}{2}$ c bid. Washington gauge, 11,816 barrels from 205 wells. The 14 wells at Taylorstown (included with above) are doing 1447 barrels a day. McKeown, Martin, No. 5, gauged 1920; Fergus No. 6, 2568 barrels in 24 hours. Martin No. 7, just burned, doing 40 barrels an hour. Pump station on the Martin farm burned, disabling the pipe line that takes the oil from the big wells. An iron tank on the Criswell farm, near Butler, belonging to Butler Gas Co., blown up by heavy pressure of gas. Mrs. Ella Dinsmore, of Clarion, found guilty of murder in the first degree.

August 21.—Sunday. Washington—McKeown's, Martin heirs, No. 4 (renumbered No. 5) is down to 60 barrels an hour. Fergus No. 6, 100 barrels an hour.

August 22.—Market opened firm at 59 $\frac{1}{2}$ c, advanced to 60c, then sold back to 59 $\frac{1}{4}$ c, rallied to 61 $\frac{1}{4}$ c and closed at 61 $\frac{1}{8}$ c. Washington—Fergus No. 5 starts at 45 barrels an hour; No. 6, 75 barrels an hour; McKeown, Martin, No. 7, 900 barrels a day while fishing for tools lost during the fire; Martin No. 5, 65 barrels an hour. Squire Riddle's barn near Prospect, Butler county, struck by lightning and burned to the ground. The Auverter well, near Lima, Ohio, made 800 barrels in 40 hours.

August 23.—Market opened at 61 $\frac{1}{2}$ c, weakened to 61 $\frac{3}{8}$ c and advanced with heavy buying to 62 $\frac{1}{2}$ c. It afterwards weakened and closed at 61 $\frac{3}{8}$ c. Carrying rates, 30@35c. Washington—Fergus No. 5, 65; No. 6, 35 barrels an hour; Martin No. 5, 50 barrels an hour; No. 7 doing 50 barrels an hour while fishing for the lost tools.

An Italian killed by a natural gas explosion near Murrsville, Pa.

August 24.—Market opened at 61 $\frac{3}{4}$ c, rallied slowly to 62c, sold off to 60 $\frac{7}{8}$ c and closed at 61c bid. Washington—McKeown, Martin, No. 5, 45 barrels an hour; Fergus No. 5, 65; No. 6, 40 barrels an hour. Martin No. 7 gets out the lost tools; last 24 hours' production, 512 barrels. Forest Oil Co.'s No. 2 well, Eversole farm, Lima field, reported to have made 300 barrels in the first 24 hours.

August 25.—Market opened at 61c bid, with a few sales at 61 $\frac{1}{8}$ c. It was sold down to 60 $\frac{7}{8}$ c, but soon firmed up and with many fluctuations advanced to 62 $\frac{1}{4}$ c, declined and closed at 61 $\frac{3}{8}$ c. Washington—Cameron No. 11 struck sand and made 300 barrels first 10 hours. McKeown, Martin, No. 5 (the big well) off to 36 barrels an hour; No. 7 (burned well) making 50 barrels an hour; Fergus No. 5, 60; No. 6, 30 barrels per hour. Discovery of natural flow of oil reported at Fort Snelling, Minn. Store of C. W. Hawk burned at Balltown, Forest county. Loss, \$6000. Death of M. F. Benedict, a wealthy citizen of Titusville, aged 64 years. Annual reunion of the G. A. R. of Northwestern Pennsylvania held at Oil City. Big parade and 10,000 strangers visit the city.

August 26.—Market opened at 61 $\frac{3}{4}$ c, rallied to 62c, broke to 61 $\frac{1}{2}$ c, boomed up to 62 $\frac{3}{8}$ c and closed at 62 $\frac{1}{4}$ c bid. Washington—Fergus No. 5 increased to 92 barrels an hour by deeper drilling; Cameron No. 11, 485 barrels in 24 hours; Martin No. 5, 35; No. 7, 40 barrels an hour. Caldwell well, on Carrothers farm, Taylorstown, down and a failure. Phillips, Stewart, No. 6, at Reibold, starts at 55 barrels an hour.

August 27.—Market opened at 61 $\frac{3}{4}$ c, sold down to 61 $\frac{1}{2}$ c, rallied to 62 $\frac{1}{2}$ c and closed at 62 $\frac{1}{8}$ c bid. Washington gauge, 11,090 barrels from 208 wells. Martin No. 5 made 840 barrels; No. 6, 192 barrels; No. 7, 960 barrels in 24 hours. Fergus No. 4, 480 barrels; No. 5, 1417, and No. 6, 504 barrels. The Taylorstown production, included with above, is 1393 barrels from 14 wells.

August 28.—Sunday. McKeown, Martin, No. 7, 37 barrels; No. 5, 33; Fergus No. 5, 57; No. 6, 23; Cameron No. 11, 18 barrels an hour. Phillips No. 6, on the Stewart farm, Reibold, made 35 barrels an hour. Well near Saxonburg, Butler county, reported showing oil.

August 29.—Market opened at 62 $\frac{1}{4}$ c, advanced to 62 $\frac{3}{8}$ c, declined to 61 $\frac{7}{8}$ c and closed at 62c. Washington—Martin No. 5, 30; No. 7, 30; Fergus No. 4, 12; No. 5, 54; No. 6, 23; Cameron No. 11, 16 barrels an hour. Phillips, Stewart, No. 6, at Reibold, declined to 17 barrels an hour. A six-year-old daughter of J. G. Fox, of Oil City, killed by a B. & N. Y. & P. train at Corry. Asa Say seriously injured by being thrown from a buggy near Butler. Meeting of Producers' Protective Association in Assembly Room of Producers' Exchange, Bradford. Ziegler & Smith well, Dustman farm, North Baltimore, O., made 1000 barrels first 24 hours after shooting. Peter Langraff falls from a derrick near Carbon Centre and sustains severe injuries. Parker & Van Wormer well, Folz farm, Cygnet, Ohio, shot and starts at 200 barrels an hour. Death of J. H. Waddell, a Bradford photographer, who was suddenly stricken blind and went insane. Mrs. Belle Feeley, an insane woman, fires her cell in the Clarion county jail and is fatally burned.

August 30.—Market opened at 62c, advanced to 62 $\frac{1}{4}$ c, receded to 61 $\frac{7}{8}$ c, rallied to 62 $\frac{3}{8}$ c and closed at 62c. Heavy buying by Roe in New York and Marlin, Bradford. Washington—Martin No. 5, 28; No. 7, 28; Fergus No. 4, 7; No. 5, 50; No. 6, 20; Cameron No. 11, 10 barrels an

hour. Reibold field gauge, 4401 barrels from 80 wells. Phillips, Stewart, No. 6, 20 barrels per hour. Boiler explodes while being tested at Kane & Ryan's shop, Bradford, instantly killing James Kane, aged 35, and seriously injuring Fred Godfrey, aged 18 years.

August 31.—Market opened quiet at 62c, declined to 61 $\frac{1}{8}$ c, advanced to 62 $\frac{1}{2}$ c, then to 63 $\frac{1}{4}$ c, sagged off to 63c, rallied steadily to 65c and closed at 64 $\frac{1}{2}$ c. Carrying rates—Bradford and New York, 35@40c; Oil City, 35c; Pittsburgh, 30c. Washington—Fergus No. 3 got first pay streak last night; doing 40 barrels an hour this morning. McKeown, Martin, No. 5, 30; No. 7, 20 barrels per hour. Fergus No. 5, 52; No. 6, 15 barrels an hour. The Parker & VanWormer well, near Cygnet, Ohio, reported to have made 5000 barrels the first 24 hours. Sam Pence, of the Eagle Restaurant, Findlay, Ohio, kills Harry Carleton, the cook, with a heavy weight.

Freight Discriminations on Petroleum.

George Rice, a producer and refiner of petroleum at Marietta, Ohio, recently made complaint to the Inter-State Commerce Commission against a number of railroad companies, charging that they had unlawfully discriminated against him in favor of the Standard Oil Co. in the transportation of petroleum. The allegations against the railroad companies are substantially the same, and we print below the substance of the charges against the Louisville and Nashville Railroad Co., which owns or operates lines of railway from Cincinnati, Ohio, through Frankfort, Lexington, Louisville, Nashville, and Memphis, Tenn., Huntsville, Mobile, and Selma, Ala., to New Orleans, La., and from Evansville, Ind., to St. Louis, Mo. The rates given show that these railroad companies are defying the law and the Inter-State Commerce Commission.

Car-load Rates per Barrel from Louisville, Ky., to

1. Mobile, Ala.....	30	cents
2. New Orleans, La.....	30	"
3. Montgomery, Ala.....	45 7-10	"
4. Selma, Ala.....	45 7-10	"
5. Birmingham, Ala.....	45 7-10	"
6. Nashville, Tenn.....	18 3-4	"
7. Memphis, Tenn.....	15	"
8. Clarksville, Tenn.....	17 3-10	"

Car-load Rates per Barrel from Cincinnati, O., to

10. Nashville, Tenn.....	25	cents
11. Decatur, Ala.....	50	"
12. Birmingham, Ala.....	59	"
13. Calera, Ala.....	59	"
14. Montgomery, Ala.....	59	"
15. Selma, Ala.....	59	"
16. Pensacola, Fla.....	45	"
17. Mobile, Ala.....	39	"
18. New Orleans.....	39	"

Rates per 100 pounds from Louisville, Ky.

Destination.	To Geo. Rice.	To Standard Oil Co.
Montgomery, Ala.....	45 7-8 cents	30 cents.
Selma, Ala.....	45 7-10 "	30 "
Birmingham, Ala.....	45 7-10 "	30 "
Nashville, Tenn.....	18 3-4 "	15 "
Memphis, Tenn.....	15 "	12 1-2 "

Rates per 100 Pounds from Cincinnati, O.

Destination.	To Geo. Rice.	To Standard Oil Co.
Decatur, Ala.....	50 cents	46 cents
Birmingham, Ala.....	59 "	47 "
Calera, Ala.....	59 "	47 "
Montgomery, Ala.....	59 "	47 "
Selma, Fla.....	59 "	47 "
Pensacola, Fla.....	45 "	40 "
Mobile, Ala.....	39 "	34 "
New Orleans, La.....	39 "	34 "

"Defendant has, in all its charges to complainant, for services rendered and to be rendered by it in the transportation of oils for him over its said lines of railroad, charged him for the entire actual weight of such oils, while defendant has, in many instances too numerous to mention without unduly encumbering the records, since April 5, 1887, charged said Standard Oil Co., for services rendered it, or to be rendered by it for said Standard Oil Co., in transportation of oils over its said lines of railroad, for much less than the actual weight of such oils."

The complaint alleges these charges to have been made May 9, 1887, and ever since, and also that since April 5, 1887, the rate charged Geo. Rice from Louisville, Ky., to

Huntsville, Ala., for transportation of petroleum in barrel packages has been 37 cents per 100 pounds, and to the Standard Oil Co. 27 $\frac{1}{2}$ cents per 100 pounds.

It is also charged that the railroad company owns tank cars which it furnishes to the Standard Oil Co., but refuses to furnish the same to Geo. Rice; that the rates per 100 pounds for transportation of oil from Mobile, New Orleans, Jackson, Tenn., Vicksburg, and Meridian, Miss., are the same whether carried in barrels or in tank cars, while to other points the rate charged for barrel packages is much higher than by tank cars; and that the railroad companies are charging greater rates for short distances than for long, giving the following as instances:

From Cincinnati, O.		
Destination.	Distance.	Rate per 100 pounds.
New Orleans, La.....	931 miles	39 cents
Birmingham, Ala.....	504 "	59 "
Mobile, Ala.....	780 "	32 "

From Louisville, Ky.		
Destination.	Distance.	Rate per 100 pounds.
New Orleans, La.....	811 miles	35 cents
Birmingham, Ala.....	394 "	52 "
Mobile, Ala.....	780 "	35 "

—American Citizen.

NOTES ON NATURAL GAS IN INDIANA.

The Citizens' Natural Gas Co. will drill a well on North Jackson street, at Anderson, Madison county.

A well is drilling for gas at Milroy, in Rush county, 40 miles southeast of Indianapolis.

Greensburg, Decatur county, has four small gas wells and the town is to be piped immediately. One is utilized to run the engine of the gas company's works, while the fourth, struck September 1, is the property of Emmert & Co., a large milling firm, and will be used by their flour mill.

The second gas well at Knightstown, Henry county, was completed August 17 at a depth of 860 feet. A strong flow of gas is reported. Two good gassers have also been drilled at Spiceland, in the same county.

Natural gas has been found at Upland, 10 miles east of Marion, at a depth of 1010 feet.

The well at Columbus, 40 miles south of Indianapolis, is a failure. A powerful vein of sulphur water was struck August 29 at a depth of 1600 feet.

The Gas and Mining Co., of Elwood, Madison county, and the Daleville Natural Gas Co., of Daleville, Delaware county, filed articles for incorporation on August 23.

Camden, in Jay county, rejoices over a gas well of the largest calibre. It is proposed to pipe the product to Fort Wayne, 40 miles north.

The Ohio Falls Land, Gas and Mining Co., of Jeffersonville, was organized August 19 with a capital stock of \$100,000, divided into shares of \$100. The Board of Directors is composed of Jacob Fry, L. F. Warder, A. J. Burlingame, S. Goldbach, H. A. Burt, C. W. Prather, R. W. Dorn, D. C. Payton, H. Rove and M. Z. Stannard. The Charleston Land and Gas Co. was organized August 18 with \$100,000 capital and the following directors: M. B. Cole, G. C. Taggart, G. H. D. Gibson, F. M. Runyan.

Greenfield, 20 miles east of Indianapolis, completed its second gas well on Saturday, August 20, at a depth of 1000 feet. The first well has a measured capacity of 5,000,000 cubic feet a day, and 160 consumers are supplied with its product. The second well made a much poorer showing than the first, but when shot on the 27th ult. it rapidly developed into a strong flow. Three more wells are to be drilled at once by Indianapolis parties.

The gas well on the Templeton farm, 8 miles northeast of Indianapolis, in the vicinity of Millersville, has been

bought to a successful finish. Trenton rock was found at a depth of 920 feet and gas was found in the next 10 feet of the rock. The gas burns through a 3-inch pipe to a height of 30 or 40 feet. This company is composed of the following stockholders: W. R. McKeen, Terre Haute; A. R. Ramsey and Moses Fowler, of Lafayette; Franklin Landers, Albert Baker, Oscar B. Hord, Frank Taylor and A. W. Hendricks, of Indianapolis.

Some Toledo capitalists have been leasing land in the vicinity of Noblesville with a view to forming another company to pipe gas to Indianapolis.

The Capital City Gas Co.'s No. 5 well was completed August 25. It is located on the Spees farm, near Lawrence, 11 or 12 miles from Indianapolis. Its estimated capacity is 3,000,000 feet a day.

Gas was struck in the Wheeler well, 3 miles northeast of Fisher's Station and 18 north of Indianapolis, August 18, at a depth of 868 feet. It is the property of the Indianapolis Natural Gas Co., which now has five gas wells in this vicinity with a capacity of 10,000,000 cubic feet a day.

INDIANAPOLIS.

The natural gas question at Indianapolis is still unsettled. The Standard refuses to make any move toward piping the city, and insists on an "open ordinance" that will allow the price for natural gas to be regulated by free competition among the different companies. Meanwhile the development of gas territory in the region within easy piping distance of the city continues, and everything seems to point to an ample supply of nature's most convenient fuel. The Standard is reported to have between 35,000,000 and 50,000,000 cubic feet ready and waiting for more favorable terms on the part of the City Council. The city stands firmly by its decision, which is plainly stated by the *News*:

"Indianapolis wants gas, and the gas companies want Indianapolis. The latter phase is as much if not more of a necessity than the former. The city is willing to hear any proposition that any company has to make. But we do not believe it is willing to give its rights out of hand. It has refused this so far, and we trust will continue to refuse. The ordinance which it has adopted may not be the thing. No one ever contended that it was perfect. The whole matter is tentative. The city wants to protect its people while holding out inducements that will bring us gas. That is all there is to it. It is a slander to say that there is any hostility to any company."

"Indianapolis doesn't want natural gas at such prices as to be burned in the furnaces of a few rich men, and that sort of folks who could afford it as a luxury, just as they afford plate-glass windows and cut-glass tableware, 'two coats and everything handsome about them.' Indianapolis wants gas at such rates that its use may be well nigh universal; such that much of its manufacturing can be done by it. We honestly believe that the fact that Indianapolis should let the Standard Oil Co. furnish gas here under an 'open ordinance'—so-called, that is high prices and freedom to 'whipsaw' any company that might try to compete, would be the worst advertisement the town could have. The ordinance only works one way. A company may put its prices down, but the process has got to be honest, for once the price is put down it cannot be raised for three years, and then only with the consent of the people's representatives in Council. Here is an awkward obstacle to the methods which the Standard Oil Co. has used. It prevents a 'drop' by which the biggest company can freeze out all the others, and then turn around and skin the town down to its marrow bones. We want to see the Council

retain that safeguard, and every other, in the present ordinance. When the time comes, if modifications are asked, let it be understood that no modifications will be granted that leave the people at the mercy of any company. Nobody grudges the handsome returns which the present ordinance will give any company, but we believe everybody is firmly opposed to any ordinance, whatever might be its profits, that would surrender the control of the situation into the hands of gas companies. Let the Standard or any company come in and supply the city and welcome. There is no prejudice against any of them. But let it be understood that they do supply the city—that the city does not supply them."

The ordinance permits of a charge of 10 cents per 1000 cubic feet, and has been drawn up after a most careful investigation of the facts furnished by the experience of other cities and towns in the gas region.

The Indianapolis Natural Gas Co. seems the only one, at present, that is making any practical progress toward piping the city. This company has secured a large amount of valuable gas territory, and at last accounts was making negotiations toward purchasing the wells and leases of J. M. Guffey & Co., in Hamilton county. These possessions will place the company on an equal footing with the Standard, so far as an ample supply of natural gas is concerned. This company states positively that it will lay a main to the city this fall. Satisfactory arrangements have been made for securing the pipe from Pittsburgh manufactories on favorable terms. It is not anticipated that an adequate supply can be brought to the city before another year.

CANTON, Ohio, is drilling for gas at a depth of 3000 feet and is still in hopes of finding it.

ELIZABETHTOWN, Indiana, will drill for gas. A company has been formed and the contract let.

NATURAL gas was struck at Amboy, Miami county, Indiana, 13 miles southeast of Peru, on September 8, at a depth of 900 feet.

MUNCIE, Indiana, brought in her eighth gas well on the 8th of September. It is pronounced the best well yet found in that vicinity.

The Greenfield Exploring and Mining Co., of Greenfield, Indiana, was organized September 8. The object of the company is to supply natural gas at cheaper rates than the present company.

THE Citizens' Gas Co. of Kane was incorporated on September 15. The names of five of the principal stockholders are James McDade, John T. Griffith, H. H. Carson, James Campbell and William Truby.

THE Chartiers Natural Gas Company has been made the defendant in a suit instituted in the United States Court at the instance of Mr. George Westinghouse for the infringement of a patent. This patent issued to Mr. Westinghouse covers a system of long-distance gas distribution. The system has been in use for some time by the Philadelphia Company and has been found to be a valuable adjunct in increasing the percentage of available gas at long distances from the wells. The patent is popularly known as the telescopic process and by the use of pipes successively increasing in diameter toward the delivery end the friction is reduced and the average pressure lessened. It is claimed that a great deal more gas can be delivered by this system than by an ordinary pipe line.

PRESENT AND FUTURE SOURCES OF HEAT.

LORIN BLODGET.

IT is admitted that the two forms of mineral carbon now most prominent in the public attention, petroleum and natural gas, are very nearly identical in constitution so far as their primary elements are concerned. Petroleum is readily converted into gas of variable calorific and illuminating power, but always readily controlled and free from any considerable residuum or waste. Nothing is found in either that constitutes a material obstruction to interchangeable use, or to joint use, after the petroleum shall be converted into gas. They come from the same geological formations, and have an origin separate from the coal, while some times appearing in great quantities in such proximity to the coal beds as to lead to the inference that they have the same derivation. The later developments in Ohio, Indiana and Kansas show conclusively that neither the oil nor the gas can, by any reasonable theory, be regarded as an associate of the coal at any period. The Trenton limestone, separated by 2800 feet of various shales and sandstones from the lowest member of the coal series, is saturated with oil, and charged with vast quantities of natural gas, both being in a form capable of ready adaptation to the most important economic uses. Valuable as coal is, there is still no comparison or form of use that does not show the great superiority of gas as fuel, and the public demand is irresistible that gas shall be sought wherever it can be found in the natural state, and in its absence that coal or petroleum shall be converted into gas for heating purposes.

It is the most striking condition of the present mineral production of the country, and, indeed, of the world, that the supply of petroleum continues in enormous quantities. It is cheaper now than at any previous time, and since the Findlay field has been opened, with so much promise of permanence as well as present quantity, the assurance of future supply at low prices is accepted by all the interests concerned. The product of our own oil fields is now 35,000,000 barrels annually, or fully 7,000,000 tons of crude oil. The Russian fields at Baku produced 2,000,000 tons in 1886, and are gaining in the rate of production as rapidly as the American field. Some very profuse flowing wells have been opened on the border of the Caspian, proving the vast resources of the Baku field. It is evident that all the greater sources of petroleum will continue active for a period of years, both in Europe and the United States. In changing from one class of geological formations to another, as has to some extent been done in Pennsylvania and Ohio, the remarkable fact is that the total product is increased and not diminished. Oil was never so cheap either at the wells, or at the refineries for consumption or for export. The export alone taking out about 15,000,000 barrels of refined and crude in the year, at a price of a little more than \$3 per barrel of forty-two gallons. The actual exports for ten months to April 30, 1887, was 64,355,937 gallons of crude oil, and 416,212,404 gallons of refined, at a total value of \$34,182,564; an increase of 15,000,000 gallons over the like period of 1886, while the reported total value is \$2,500,000 less than in that year.

Obviously, the relative cost of petroleum in any form is to continue less than heretofore, and not to increase for some years yet. At the present prices of crude, this would be the cheapest fuel possible, in any circumstances securing its complete combustion. It is cheaper

than coal, and more readily available anywhere beyond the immediate coal mining districts.

The important question is to secure a cheap conversion of petroleum into gas, and a method of combustion of this gas which develops its highest calorific effects. All the methods heretofore applied have failed to burn oil to advantage in liquid form, or to volatilize it from the liquid form at the place and the time of combustion. It is not as available as solid carbon is, because the heat first attained is absorbed in volatilization, and the gaseous products pass off unburned. It is unfortunate that no sufficient study of this question has been given in the oil producing districts, where proper uses of crude oil as fuel would have greatly aided in securing an adequate price for the oil as first produced.

The great creation of new resources through the discovery of petroleum has been equalled, if not exceeded, in the discovery of natural gas—the most incredible of all the suggestions for applying, if not almost creating light and heat. Natural gas is the analogue and associate of petroleum rather than of coal, and it exists in the state of occlusion in all the formations yielding oil, being condensed on these formations, and permeating them even more completely than the oil. It is liberated when they are penetrated by the drill, and escapes with enormous force, and such continuous flow as to present the most difficult question as to its primary constitution. It is not from cavities, which are exhausted by the discharge of their contents, nor does science yet afford an entirely sufficient explanation of the condensation of gases defined by the term occlusion. It is only known that many gases, and especially hydrogen and its compounds, may and do exist in condensed form, almost intangible as solids or fluids.

Natural gas is supreme over all other economic sources of heat and of power, wherever the productive formation exists, but it cannot, as petroleum can, be carried far beyond these natural fields. It is badly and wastefully consumed where it is most abundant, so badly that in the ordinary use 65,000 feet of this gas are required to manipulate a ton of iron, and in improved furnaces 35,000 feet. As its calorific capacity, if properly burned with accession of air, is many times greater than this, such waste should not be permitted to continue. The ordinary methods of burning natural gas are almost as ineffective as the burning of petroleum in the liquid state, and cannot develop or apply the heat it is capable of producing.

Since the opening up of the vast resources of the Trenton limestone formations in natural gas, this product leads all others in the public attention, and for some time to come it will be used with wasteful profusion, and still with the greatest profit, in the districts where it is produced. The world outside of these favored territories must yield it precedence, and must secure some approach to its economies, or give up all competing business. If they can obtain gas through pipe lines, it will be their interest to do that, but if not, they must cheapen their fuel otherwise. It will be difficult to make iron, even in the anthracite coal regions, as cheaply as it will be made west of the Alleghanies. Toledo and Findlay, with many places in Indiana, scarcely known by name outside that state, are likely to compete with the industries of Eastern Pennsylvania on terms which now look very threatening to Eastern supremacy. The pressure of Western competition is already severely felt even in the "iron and coal regions," and iron works there find that greater economies are necessary if they are to retain their position.

What economies are practicable? What better utilization of heating appliances, or of the sources of heat? The cost for melting heat for steel is at present very great in an anthracite furnace and also in the Siemens regenerative furnace, although the costly plant required in this last case does effect an important economy of fuel. But if the Siemens producer or crude gas, is valuable to some extent, why cannot the greater reform of a perfect heating gas be substituted with still better results?

The entire question turns upon the practicability of making and using gaseous fuel of the highest calorific capacity, and with the simplest and most effective forms of application to industrial uses.

It is certain that the hydrocarbon fuels, whether solid, liquid or gaseous, may be burned with a very great increase of calorific effect above those now realized. It is certain that the contained carbon of either of these fuels is not the only source of heat, if they are properly burned. By the use of proper appliances for securing the mixture of air or oxygen, a hydrocarbon flame is greatly intensified whether in a coal fire or otherwise, and alike in the combustion of coal, oil and hydrocarbon gas. It is not usual to obtain or to utilize one-third of the theoretic heat capacity of a coal fire under boilers, and very simple methods for supplying air to the half-burned gases over such a fire surface will increase the utilized heat one-third. If these gases could be separately produced, and burned with admixture of larger proportions of air, the economy would be much greater. The utilized heat from a ton of coal burned in an ordinary furnace, under boilers, should be at least three times that now realized.

But the highest attainment in heat utilization is not possible with coal in any form of combustion now known, and this because of the large admixture of non-combustible elements, the ash and cinder, and of the difficulty of changing its carbon to the gaseous form. It costs as much to volatilize the carbon of solid coal of any sort, anthracite or bituminous, as it is worth for heating purposes in comparison with petroleum or with natural gas. If we could not volatilize petroleum more cheaply than coal, all alike would give way to natural gas as long as that shall last. Natural gas is incomparably the cheapest of all fuels, and if burned as it should be or with proper accessions of enriching gases and of air, it would go much farther than it goes now. It must be met in the districts outside of its own geological field by every possible device for cheapening power.

At present, there is a resource in petroleum which will give a heating gas of the highest power at a very low cost; a cost not greater than that of natural gas in many of the outlying towns fifty to eighty miles away from the gas wells. Crude oil is so cheap and easy of transportation, that distance from the oil wells is not a consideration. The method of converting oil into gas has been perfected, or if not absolutely perfected, it is not easy to conceive what improvement could be made or may be desired. It makes an illuminating gas of the very best quality far superior to the gas from coal, and needing no purification from poisonous or injurious elements.

THE FUTURE FUEL GAS.

The greatest single question of the present time relates to the utilization of fuel gases—not so much to the generation or making of such gases, as to their economic application to industrial use. The usual theories as to the combustion of fuels, whether solid, liquid or gaseous, do not recognize any material difference in them, or,

rather, do not admit the evolution of heat otherwise than by the combustion of carbon. And in such combustion the solid forms are held to have like equivalents of heat with the gaseous forms. Such is the theory of heat units, and it is only necessary to determine the actual quantity of contained carbon in any gas to define its heat producing capacity in combustion. A pound of carbon in the form of coal is simply equal to a pound of liquid carbon in oil, or a pound of carbon in hydrocarbon gas. If these assumptions are true, there can be no gain in converting either coal or oil into a hydrocarbon gas: the cost of such conversion is wasted, because the resulting product is no better, theoretically, than the original form. It may be more convenient to handle, but it has only the original number of "heat units," and therefore, while mechanically more valuable, is not an intrinsically greater source of heat.

But the utilization of gaseous fuels has already taught an important lesson as to their superior value absolutely, and as to a source of heat additional to that derived from the combustion of ordinary fuel. It is not the complete burning of the combustible or hydrocarbon gases only that is attained; it is an additional and superior source of heat, the result of the union of oxygen and hydrogen. It has long been known that the combustion or union of oxygen with hydrogen under the conditions of the oxy-hydrogen blow-pipe produces the most intense heat possible in ordinary manipulations, and a ready melting heat for the most refractory metals or minerals. It is remarkable that the occasional illustrations of its heating power occurring in blast furnaces, and in many processes of ordinary metallurgy, have not led to its utilization on an industrial scale. It appears that a pure hydrocarbon gas, and particularly a hydrocarbon mixture prepared for illuminating uses, and with an accession of hydrogen from superheated steam, is capable of producing intense heating effects when burned with an adequate volume of oxygen derived from common air. The hydrogen alone would constitute a distinct source of heat if free to unite with the oxygen of the air, and the oxygen of the ordinary atmosphere appears to be as readily available for the oxy-hydrogen union as it is when isolated for this especial purpose. The calorific effects of the oxy-hydrogen blow-pipe need not be restricted to the uses of the laboratory, nor is it necessary to isolate either of these gases to produce these heating effects on a scale amply large for any industrial uses. The actual utilization of an illuminating gas derived from petroleum by the process of J. J. Newell, (No. 314,871) and applied in combustion by the process of Benninghoff and Jewell (Nos. 344,615 and 344,616), prove the value of this method, and illustrate the facility with which mechanical results may be attained. And, although the final application of these gases to heating purposes appears to involve difficulties never before surmounted, especially in final delivery of the mingled gases and mixture of air with the gases to the combustion chamber, the inventions of Jewell in the Benninghoff and Jewell patents, secure a perfectly safe delivery, and an absolutely complete combustion, with heating effects much above the requirement for melting steel, cast iron and even platinum. In no previous apparatus has the safety of transmission to the point of combustion been secured, and to this cause as much as to any other, has the failure heretofore to make it available been due.

In the direction of securing a better combustion of gases, many steps have recently been taken, the most valuable being the Siemens regenerative furnace. This

is intended to secure the complete combustion of the gases liberated from coal in the ordinary methods of burning it, and it does not appear, that even in the latest suggestions of the surviving brother, any hope is entertained of obtaining more or other heat than that yielded by burning the carbon gases. Probably there is greater heat evolved than the carbon alone yields, and the hydrogen present may be to some extent separately burned by the air blast. It is doubtful whether a steel melting heat of 2,500° can be obtained by the combustion of carbon alone, or without some proportion of oxy-hydrogen combustion.

The process of gas generation from petroleum now for several months in operation at Darby, this state, furnishes a perfect illuminating gas of twenty two candle-power by the volatilization of less than seven gallons of crude oil to the 1000 feet of fixed gas delivered to the holder. Ordinary coal gas was made at these works until recently, but the oil gas has been found the best and the cheapest. The coal gas could not be utilized for heating purposes, although tried by the Benninghoff and Jewell process, and tried in the same way as is now followed to produce a steel melting heat, by using the gas derived from oil. It is certain that no form of producer gas, whether derived from bituminous or from anthracite coal, is pure enough to develop the heating effects possible with oil gas. And it is also probable that producer gas, as well as coal gas of every sort, cannot be adapted to the oxy-hydrogen combustion, or be used in direct connection with it.

It is found by tests which have been brought to the writer's attention within a few weeks, that the heat possible from coal or carbon in any form, solid, fluid, or gaseous, may be intensified at least five times by the oxy-hydrogen flame and may be made available at the first combustion; and that 1,500 feet of hydrocarbon illuminating gas of twenty-two candle-power will produce an adequate melting heat for a steel crucible of 100 pounds capacity, the complete melting being effected in two hours, as compared with four hours by the best coal fire with blast, and six hours by the Siemens regenerative gas furnace. Smaller quantities of steel can be melted in less time; seven pounds in forty minutes, and steel or platinum wire or any like refractory substances can be fused in this flame as quickly as in the blow-pipe of the laboratory.

All this heating and melting is done in open and free mechanical situations, and at any distance from the gas generator, the only appliances being suitable pipes for both the gas and the air, and furnaces of sufficient refractory materials, or linings. The gas must be a pure oil gas, charged with hydrogen from superheated steam, and made into a fixed gas in a proper generator. In the trials now making at Darby, the oil gas is made for illuminating purposes and so used in the regular supply for the town of Darby.—*Light, Heat and Power.*

The Average Price of Crude.

The following table gives the average price of crude certificates, on the floor of the Bradford Oil Exchange, since March 1, 1879:

MONTH.	1879	1880	1881	1882	1883	1884	1885	1886	1887
January	110 1-5	95	83	92 3/4	111 1/2	70 3/4	88 3/4	71	
February	103 1/4	89 1/4	85 1/4	101	104 3/4	73 3/4	80	63 3/4	
March	86	89	82 3/8	80 3/4	97 1/2	100 1/8	80 3/4	77 1/8	63 1/4
April	78 3/8	76 5/8	84 1/8	78 3/4	92 3/8	91	78 3/8	74	64 3/4
May	73 1/2	80 1/4	81 1/2	70	99 3/8	85 1/2	79 3/8	69 3/8	64
June	68 3/8	100 1/4	81	54 1/2	117 1/4	68 3/4	82 1/4	67	62 3/4
July	69 7/8	101 1/4	76 1/2	57 3/8	108	63 1/2	96 3/8	66	59 1/4
August	67 1/4	90 3/4	78 3/8	58 3/8	108 3/8	81 1-5	100 3/4	62	60
September	69 1/4	95 1/2	92 1/4	71 1/2	112 1/2	78	100 1/4	63 3/8	
October	88 3/8	96 3/4	92 3/4	93 3/8	111 1/4	71	105 3/8	65 3/8	
November	105 3/8	91 3/4	82 3/4	114 3/4	114 4-5	72 1/2	104 3/8	72	
December	113 3/4	92 3/8	83 3/4	95 3/4	114 3/4	74 3/4	89 3/8	71	

The Macksburg Field in August.

The production of the Macksburg field, estimated from the pipe line runs, the shipments of the West Virginia Transportation Company, etc., averaged about 229 barrels a day for 1884. The gross runs of the Macksburg pipe line since January 1, 1885, with the estimated amount of oil shipped from the field through other channels is given below. The averages represent the best obtainable figures on the production of the field:

1885.	Macksburg P. L. Runs.	Outside Shipments. Est.	Daily Average Production.
January	11,894	1500	432
February	20,625	1500	790
March	27,067	1500	922
April	40,527	1500	1400
May	48,258	1500	1605
June	64,982	1500	2216
July	75,737	1500	2492
August	74,228	1500	2443
September	68,110	1500	2320
October	63,619	7000	2278
November	60,926	7000	2264
December	61,113	7000	2197
Total	617,086	34,500	1785
1886.			
January	54,806	7000	1994
February	49,694	7000	2025
March	58,795	8973	2186
April	64,137	7890	2401
May	58,596	6630	2104
June	65,379	2871	2275
July	58,410	4080	2016
August	57,492	2790	1945
September	48,918	1240	1672
October	46,937	3240	1619
November	41,359	4090	1515
December	40,578	3040	1407
Total	645,101	53,844	1682
1887.			
January ..	37,134	4500	1343
February	28,514	1200	1061
March	32,549	7400	1015
April	20,128	4200	1110
May	27,750	1500	970
June	28,609	3300	1010
July	23,443	3500	880
August	25,710	2700	900

There were no wells completed in the Macksburg field in August. Three wells were finished in July and none in June. There were 2 wells drilling at the close of the month, but no new rigs had been erected. Two wells were abandoned during the month, and on the 31st of the month there were 468 wells in the Macksburg field and the daily average production was 880 barrels.

The 2 wells west of Cambridge, Ohio, have been shut down and mystified.

THE EUREKA DISTRICT.

The Johnson well on French Creek has been drilled deeper and abandoned as an entire failure. Brown No. 3 has stopped drilling for want of water; No. 2 is pumping about 10 barrels, while No. 1 is still fishing. Brown has started a well on Bear Run, in shallow territory. Barnsdall is erecting a rig for a gas well.

THE total exports of petroleum from America, in gallons, according to a German circular, from January 1 to August 5, for the years 1886 and 1887, have been as follows:

	1887. Gallons.	1886. Gallons.
To Europe	232,106,647	223,784,458
To East Indies, etc.	70,104,684	92,304,350
Total	302,211,331	316,088,808

THE Standard Oil Co. is reported to have purchased 40,000 acres of prospective oil lands in Fremont county, Colorado, which will be operated at once.

A SOLID vein of pure rock salt has been struck at Ellsworth, Kansas, at a depth of 735 feet. It is 160 feet thick.

THE PETROLEUM AGE,

DEVOTED TO THE
INTERESTS OF THE PETROLEUM TRADE.

PUBLISHED MONTHLY BY

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BRADFORD.

THE METROPOLIS OF THE NORTHERN OIL REGIONS AND ITS CLAIMS AS A MANUFACTURING CENTRE.

THE city of Bradford has long been famed as the metropolis of the great northern oil basin, and its peculiar and novel features have given it a unique position and made it an interesting point for travelers and tourists. Its rapid progress and development in all that goes to make up a modern town are unsurpassed in a country that has furnished so many examples of villages of rapid growth and speedy decline. But unlike the numerous examples of towns and cities that have preceded her, Bradford, outside of the wealth of her mineral resources in the line of crude petroleum, possesses all the elements that lead to substantial greatness and permanence. Situated on the northern borders of McKean county, within 4 miles of the State line that separates the Empire State from the great State of Pennsylvania, and surrounded by forests as yet but little touched by the encroachments of the woodman, within close proximity to coal beds of acknowledged value, and natural gas fields that have no superior in the world, the city lays claim to something more substantial and lasting than the generality of oil region towns. While 17 miles south of the main line of the Erie connecting system between the East and the West, it forms the natural centre and converging point of another lot of roads that give it unexcelled facilities for communication with the outside world. The accompanying map makes plain the position of the city that is now inviting the attention of capitalists and manufacturers, and setting forth its great natural advantages, with allurements of a more substantial nature to manufacturers seeking a desirable location for their business.

The narrow-gauge railroads that were built to supply the pressing needs of the great army of oil producers in the early days of the Bradford oil development, now furnish the best of transportation facilities for other enterprises. With the advantages afforded by these roads, which cheaply reach the most desirable shipping points in the country, the lumbering resources are being developed on a large scale. The immense tracts of hemlock timber supply some of the largest tanneries in the world and numerous works for the manufacture of wood acid, wood alcohol, hemlock extracts and allied products are springing up at various points on the edges of the big forests. Large deposits of glass sand in different parts of the county, with the advantage of a cheap and abundant supply of natural gas, ought to prove a strong inducement to manufacturers of all kinds of glassware, and Bradford has already made good progress towards establishing works of this kind. An abundance of soft coal, within easy distance of the city, can be utilized to good advantage in various ways. The presence of fire

clay of a superior quality in various sections of the county has also been demonstrated which is well adapted to the manufacture of fire brick, and can be utilized in puddling furnaces, etc.

The city is situated at a considerable distance above sea level and the air is pure and wholesome. No healthier place of its size can be found in the United States. An abundant supply of pure water is an assured fact, and numerous mineral springs, possessing varying medicinal qualities are abundant. South and west of the city are the great gas-producing districts which furnish wells of the heaviest pressure and greatest endurance. The two companies that are competing for the gas business of the city both obtain their supplies from the great gas geysers of the Kane and Wilcox fields of McKean county. Salamanca and Buffalo are likewise supplied from this section. The Bradford Gas Light and Heating Co. has furnished Bradford citizens with light and fuel for eight or nine years. The Manufacturers' Gas Co., a much younger organization, has secured a permanent footing in the city and is busily engaged in enlarging its present plant.

SCHOOLS AND CHURCHES.

Bradford takes great pride in her excellent school system, and has been peculiarly fortunate in possessing for her inhabitants progressive and intelligent citizens, who have insisted that no expense should be spared in the educational line. Unlike many other places that are remarkable for the rapidity with which they have sprung into existence, Bradford has taken time to build beautiful school houses and exercise discretion in the choice of first-class teachers. Oil producers families, as a rule, are large, and during the days of prosperity in the oil business a large share of the wealth so abundantly poured out has been expended in providing educational advantages for the children of oildom.

Five large congregations worship each Sabbath day in as many large and commodious churches. The Presbyterian, the Methodist, the Baptist, the Episcopal and Catholic denominations of the Christian faith are largely represented and presided over by intelligent and progressive pastors. The United Brethren and African Methodist churches are smaller in membership but possess an active and intelligent body of worshipers. The Hebrew sect is divided into two bodies, which worship in different synagogues and under different expounders of the faith.

RAILROAD FACILITIES.

The Bradford railroads can be conveniently referred to two classes, the broad and the narrow gauge. The Bradford branch of the N. Y., L. E. & W. R. R. was the first to enter the county. It joined the main line at Carrollton, and was built southward as far as Alton for the purpose of obtaining the soft coal that was mined in that vicinity, before the presence of petroleum had been discovered in the county. It has since been extended farther to the southward to reach the extensive deposits of coal in Elk county, and joins the P. & E. R. R. at Ridgway. Soon after leaving Alton this road crosses the south branch of Kinzua Creek over a magnificent iron bridge that enjoys the distinction of being the highest bridge in the world. The middle span is 301 feet above the bed of the stream that flows beneath. The Bradford, West Branch and Sugar Run Railroad is an important branch of the Erie that extends from Bradford up the West Branch of the Tuna, into the heart of the great forests in the northwestern part of the county.

The Buffalo, Rochester and Pittsburgh Railroad consists of two sections between Bradford and Rochester

and one between Bradford and Pittsburgh. It has recently made Bradford its headquarters for the running of trains, and most of its large shops are located here. It forms a connecting link between the oil regions and the great traffic route of the New York Central at Rochester and Buffalo.

The narrow gauge roads are four in number, and all but one are controlled by the Buffalo, New York and Philadelphia organization. One road, 20 miles in length, connects Bradford with Olean, where it meets the broad gauge division of the B., N. Y. & P. R. R. Here through routes are made for either Buffalo, Rochester or Philadelphia. Another road extends from Bradford to Eldred, another point in McKean county on the line of the B., N. Y. & P. R. R., which extends from Buffalo to Emporium, in Cameron county. The third narrow gauge line is 29 miles long and extends from Bradford to Kinzua Village, where another branch of the B., N. Y. & P. R. R. is met, which forms an easy connecting link between the upper and lower oil regions, passing through Warren and Oil City and reaching as far as Pittsburgh. The fourth narrow gauge road, the Bradford, Bordell and Kinzua R. R., begins at Bradford and extends to Smethport, the county seat, where it likewise meets with the B., N. Y. & P. system. A branch also extends northward via Eldred to Wellsville, passing through the extensive oil developments of the Allegany field. Another branch, running to the southwest, extends to Kane and connects with the great narrow gauge route of the Pittsburgh and Western Railway. On the map this extension, as well as that of the B., R. & P. R., is indicated by a broken line.

THE CITY.

The city at present numbers between 10,000 and 12,000 inhabitants. It received its charter and elected its first Mayor in the spring of 1879. The principal business portion of the city is centered along the main street, which, within the past five years, has been graced with buildings that are a credit to the enterprising citizens of the town. Two large brick oil exchanges, the St. James Hotel, the Riddell House, Pompon Hall and several other substantial structures of imposing size and appearance, a broad and well paved street, thronged at all hours of the day with a bustling mass of humanity, lend a metropolitan appearance to this active centre of the oil industry. The principal stores and markets are conducted on a scale known only in the largest cities. All the conveniences and luxuries of modern life are to be found in a city that as yet may be said to be literally in the backwoods. The soil does not appear of an inviting character to the market gardener, and the rough and steep wooded hills and mountains seem to present few charms to the agriculturist, but it lends itself readily to cultivation and most of the fruits and vegetables of the northern clime can be raised in great perfection. The domestic portion of the city possesses many beautiful residences and substantial homes. The people as a class are frank, open and free, and there is an entire absence of the selfish exclusiveness, noticeable among the so-called "upper classes" of the older towns and villages. The public spirit is democratic and free from prejudice, and it is necessarily a very strange individual who cannot find social intercourse suitable to his liking amid the multifarious forms of society that exist in Bradford.

MANUFACTURES.

Bradford has for a long time been the headquarters for the manufacture of the numerous tools used in the drilling of oil wells. The Oil Well Supply Co., Bovaird & Seyfang, W. C. Walker & Co. and several others have

large shops where nearly everything about a drilling or pumping well is manufactured. Sucker rod shops, boiler works and repair shops are exceedingly numerous. Several small oil refineries have likewise been successfully established. But outside of the manufacture of appliances pertaining particularly to oil and gas wells little as yet has been done in other directions. Four large acid works have been erected at points outside the city limits. A good business is being done in the manufacture of wooden toothpicks. Glass and furniture factories have been tried with varying degrees of success. Small factories devoted to the making of bed springs, washing machines and various small articles of a similar nature are now being conducted on a limited scale. The forests that stretch in all directions from the city are rapidly filling up with saw mills, extract works, handle and hub factories and the different manufactures that make use of hard woods in large quantities. Tanneries on a large scale have also been erected at various points in the county. The largest, located at Limestone, six miles north of Bradford, has built over 20 miles of railroad in its operations in the hemlock forests of the West Branch.

BRADFORD'S OIL INTERESTS.

The oil interests of Bradford still overshadow all other industries, and the city remains the pulsating centre of the largest area of continuous producing oil territory in the world. The great northern basin at present consists of nearly 100,000 acres on which about 15,000 wells have been drilled. There are now upwards of 14,000 producing wells in the field with a daily yield of about 22,000 barrels. At one time in its history the Bradford field was producing at least four times this amount daily. The oil was gushing forth uncontrolled from thousands of bore holes in greater quantity than the ingenuity of man could care for, and thousands of barrels of the light producing product rushed down the hillsides, filled the streams and wasted itself in a hundred different ways. The great Bradford field has produced upwards of 140,000,000 barrels of oil, nearly one-half the total yield of all the oil districts of the United States. The city has profited largely by this immense amount of wealth, although the greater portion of it has been derived for the benefit of shrewd investors and heavy companies outside.

EARLY HISTORY.

The county of McKean was formed from that of Lycoming by act of the Legislature March 26, 1804. Its original area was 1442 square miles. It parted with a portion of its territory when Elk county was formed in 1843, and another portion was taken from it for Cameron county in 1860. It now contains about 1000 square miles or 640,000 acres.

The northwestern portion of this State was owned and occupied by the warlike Seneca Indians, and was ceded by them to the Government in the treaty made by the Six Nations at Fort Stanwix, N. Y., Oct. 23, 1784. By this treaty the Indians surrendered all their claims to lands in the State of Pennsylvania, except a small area on the banks of the Allegheny River, 12 miles north of Kinzua Village, which was reserved to Cornplanter, the well-known Seneca chieftain. Here he settled about 1791 and resided until his death in 1836.

McKean county was named in honor of Thomas McKean, who for nine years was Governor of the State. At its formation it, together with the county of Clearfield, was placed under the jurisdiction of Centre county and its records were kept at Bellefonte. In August, 1804, McKean was erected into a township called Ceres by the Quarter Sessions of Centre county. Roads were

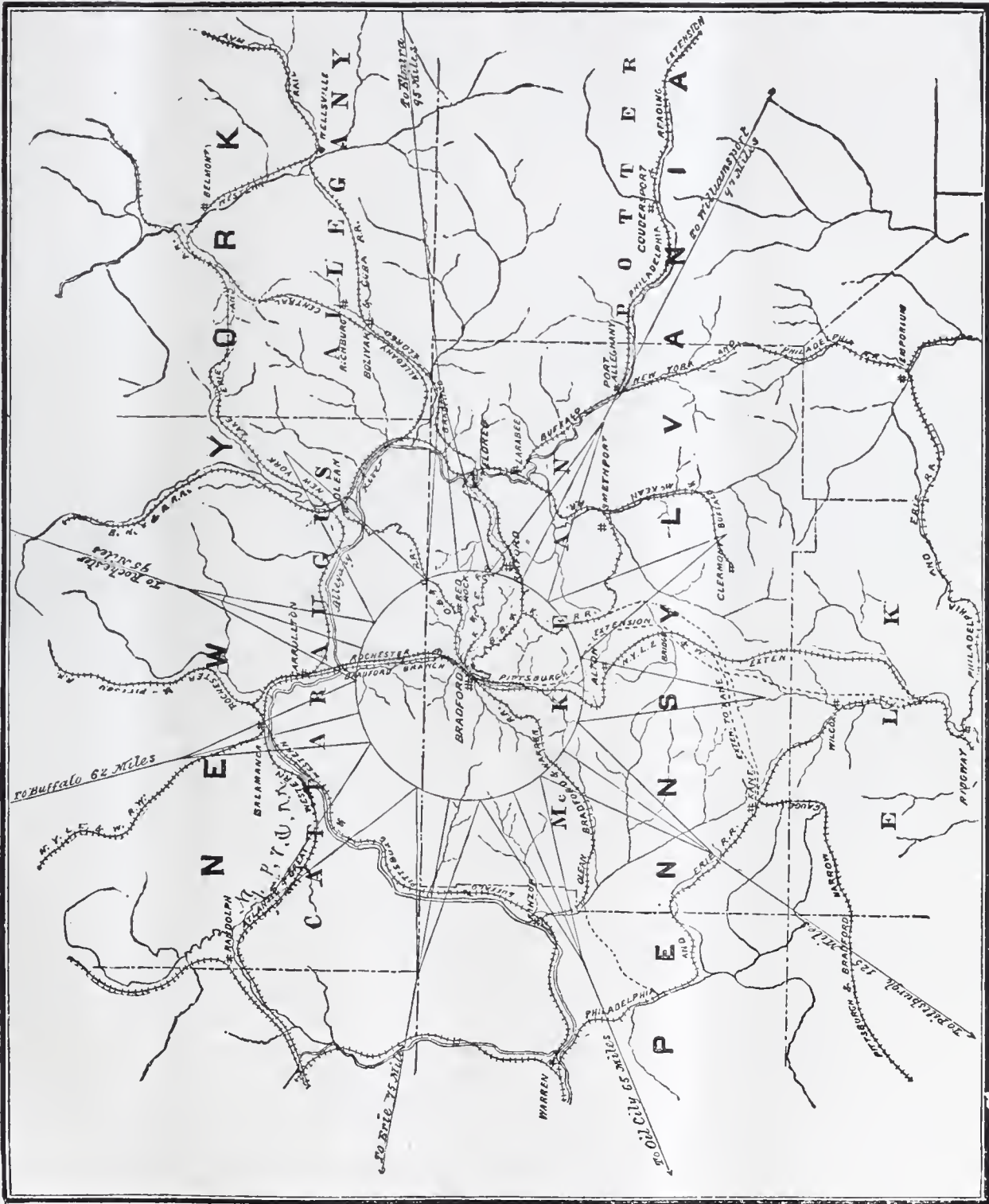
laid out by the court in 1806, and in 1810 Sergeant township was formed.

The county early began to attract the attention of land speculators, and McKean's wooded acres were parcelled out in immense tracts to ambitious lumber companies soon after the formation of the county. The first settlements were made along the Allegheny River, and the first settler was Francis King, the agent of the Keating Land Co., who brought a company of workman and

founded King's Settlement, now the village of Ceres, in the spring of 1798.

The valley of the Tuna failed to attract the attention of the early settlers until 1826, when Joshua Barnes and Barnabas Pike built a flutter wheel saw mill at State Line. The United States Land Co. secured 250,000 acres in the county, and in December, 1837, Col. Levitt C. Little, of New Hampshire, settled on the present site of the city of Bradford. The little village that sprung up

BRADFORD AND ITS RAILROAD CONNECTIONS.



under the Colonel's management of the lumber business was named Littleton in honor of its founder. The first log house was built close to the banks of the creek, at about the point where the old lockup now stands. Colonel Little built a more pretentious house on the spot which the Berry block now occupies. The pine shingles with which the Colonel's roof was covered were made from the big trees that grew in close proximity to the new house. Under the energetic management of Colonel

Little the village was mapped out into streets, much as they are at present. The first plan of Littleton was drawn by Calvin Leech, a Boston engineer, in 1838. C. D. Webster made another plot of the village in 1840, which shows that provision had been made for a meeting house, a school house, a public park and a system of water works. The meeting house was to be located at

The map accompanying this article was kindly loaned by the Bradford Evening Star.

the head of Main street, where the St. James Hotel now stands. Main street was likewise known as the Smethport road, while Mechanic street was called for a short distance Mechanic's Row; its extension southward, the Warren road; the northward route across the bridge was called the Olean road. Congress street was a small lane that connected Main street with the Corydon road, as Corydon street was then called. The creek had not yet had its harsh-sounding Indian name of Tunanguant shortened to the more elegant and smooth flowing Tuna.

Littleton prospered slowly in the manner of primitive lumber towns. Its name was changed to Bradford, and in 1858 a weekly newspaper made its appearance. The railroad came, and lastly, in 1875, the amazing news ran through the Tuna Valley that Crocker had "struck oil" at Tarport. The excitement grew with the incoming of the oil men, and the transformation from old to modern Bradford was still most wonderful of all.

THE BOARD OF TRADE.

The Bradford Board of Trade is an organization of business men and citizens desirous of placing the city in a position where it will not be entirely dependent upon the oil industry for its support. With this object in view the Board is empowered to make liberal concessions to any bona fide manufacturers that are seeking to establish themselves. An efficient agent in the person of Col. A. I. Wilcox has been secured, whose mission it is to invite prospective manufacturers to the city and give them every opportunity to investigate Bradford's claims for consideration as an industrial centre. The Colonel has already made considerable progress and is very enthusiastic over Bradford's future prospects. The Board of Trade, as reorganized in April, 1887, is officered as follows: President, C. B. Whitehead; Vice-President, R. B. Stone; Treasurer, W. W. Brown; Secretary, C. H. Kennedy.

SUMMARY of the Statement of the Tidewater Pipe Company, Limited, for August, 1887:

Quantity of crude petroleum in custody at beginning of August.....	Barrels.
Quantity of crude petroleum at close of Aug. 1,722,303.11	1,536,760.74
Less sediment and surplus.....	176,593.22
Receipts during August.....	1,545,709.89
Received in iron tanks.....	168,007.25
Deliveries during August—to refiners.....	47,703.61
to other parties.....	204,275.15
Outstanding certificates, accepted orders, etc.....	910,000.00
Credit balances.....	635,709.89
Total liabilities August 31, 1887.....	1,545,709.89

JULY SUMMARY.

Quantity of crude petroleum in custody at beginning of July.....	Barrels.
Quantity of crude petroleum at close of July 1,717,376.06	1,561,836.52
Less sediment and surplus.....	180,615.32
Receipts during July.....	1,536,760.74
Received in iron tanks.....	165,757.97
Deliveries during July—to refiners.....	37,516.76
to other parties.....	225,275.86
Outstanding certificates, accepted orders, etc.....	881,000.00
Credit balances.....	655,760.74
Total liabilities, July 31, 1887.....	1,536,760.74

Comparative Statement.

STATISTICAL SUMMARY OF THE PETROLEUM SITUATION.

	1887. August.	1886. August.
Wells completed.....	152	328
New production.....	6,847	13,790
Dry holes.....	37	42
New rigs.....	56	142
Old rigs.....	101	142
Drilling wells.....	132	318
Total field operations.....	289	602
Average daily pipe line runs.....	59,466	76,880
Average daily shipments.....	68,439	64,949
Total stocks custody pipe lines.....	31,258,079	33,423,472

THE MARKET.

Refined in New York.....	6½	6¾
Opening price of crude for the month.....	58	65½
Highest price of crude for the month.....	65	66
Lowest price of crude for the month.....	56¾	59½
Closing price of crude for the month.....	64½	61¾
Average price of crude for the month.....	60	62

THE PRODUCING REGION.

At the beginning of August there were 66 new rigs and 143 drilling wells in the New York and Pennsylvania oil region, a total of 209. The number of wells completed in August was 152 with an estimated new production of 6847 barrels. The dry holes numbered 37, leaving 115 productive wells, with an average yield of 59½ barrels. In July the new producing wells were 127 and their average output 16½ barrels. In June there were 144 productive wells finished, which averaged 44 barrels each, and the dry holes were 35 in number. The new wells in May averaged 29 barrels, the April 49 barrels, the March wells 42½ barrels, the February wells 65½ barrels, and the January wells 30 barrels each. The August figures show a decrease of 10 completed wells and an increase of 4754 barrels in the new production. The increased yield is supplied almost entirely by the fresh crop of gushers in the McKeown annex to the Washington field. The July figures showed a decrease of 17 wells and of 4287 barrels new production as compared with the figures for June. June revealed an increase over May of 33 wells and 3198 barrels new production. May had a decrease of 23 wells and of 3056 barrels new production, while April recorded an increase of 36 wells and of 2451 barrels in the new production over March. In August, 1886, there were 328 wells completed, including 42 dry holes, and the new production was 13,790 barrels.

At the close of August there were 56 new rigs, 101 old rigs and 132 drilling wells in the entire region, a total of 289 as compared with 66 new rigs, 108 old rigs and 143 drilling wells, a total of 317 at the close of July. This is a decrease of 10 new rigs, 7 old rigs and 11 drilling wells, or a net decline of 28 in active operations from the figures of July 31. July showed a decline of 4 from the June record, while June declined 36 from May and May 7 from April. April had a decrease of 9 in rigs and drilling wells from the March report, while March showed an increase of 7 in active operations over February, February a decrease of 40 from the January report, January a decrease of 48 from December and December of 95 from the November figures. At the close of August, 1886, the record showed 142 new rigs, 142 old rigs and 318 drilling wells, a total of 602.

THE ALLEGANY FIELD.

There were 3 wells completed within the confines of the Allegany field in August of the 4 to 5-barrel a day order, against 2 non-producers of oil in July. Seven wells were completed in June and the same number in May. The work of abandoning old wells continues, but there is no pressing demand for the second-hand supplies. No work of an experimental nature is mapped out and the field is fast approaching the condition of "innocuous desuetude." Production is down in close proximity to 4000 barrels a day, and only 2 new rigs and 6 drilling wells were in progress at the close of the month.

THE BRADFORD FIELD.

Bradford presents nothing out of the common for August. Ten new wells were completed with a production of 92 barrels. July finished 20 wells, 1 of which was a duster. There were 22 completed in June and 13 in May. At the close of August there were 6 new rigs and 11 drilling wells in the Bradford field, as compared with 8 new rigs and 12 drilling wells at the close of July.

WARREN AND FOREST.

There were 45 new wells completed in the Middle field in August, including 12 dry holes, and the new production was 340 barrels. This is a decrease of 3 wells and an increase of 7 barrels production as compared with the

figures for July. On the last day of August this division of the producing region showed 13 new rigs, 25 old rigs and 24 drilling wells, against 18 new rigs, 26 old rigs and 37 drilling wells on the last day of July.

KINZUA VILLAGE—There is still chance for a southwest extension of the pool west of the river at Kinzua Village, and a well is under way to test the theory. Sill & Odell's No. 7, on the Johnson tract, one location in advance southwest of their big well, started at 250 barrels. The Morse estate and McCalmont Oil Co. drilled a couple of 50-barrel wells during August. Present operations are on a limited scale and nothing particularly inviting is in sight to cause any sudden revival of interest.

Brown Bros. & Nesmyth completed a duster on Cornplanter Run, several miles up the river from Kinzua. It was drilled to a depth of 1506 feet. Several veins of gas were struck at various points which exhibited great pressure, but having no body of sand rock behind, soon became exhausted. A dry hole was also drilled on the Gardner farm, in Glade township, and another on the Lee farm, near Irvineton, in Conewango township.

Clarendon, Tiona, Kane, Cooper, Balltown and Grand Valley are fast seeking the same dull and even level of inactivity. J. C. Welsh found another dry hole in the southwest end of the Balltown pool. Nothing is being done in the Cooper section. Kane completed no wells in August, but will finish two the present month. Dunn & Co. drilled a dry hole on the Hayes farm at Grand Valley. Cappeau & Co. completed a very small well near Enterprise. The Middle field nowhere presents anything of a dangerous character. The old pools are pretty well defined, and seekers after new ones are less numerous than heretofore.

ELK COUNTY, ETC.—Three ordinary wells were completed in the Elk field during August. The northeastern end is attracting more attention and several important test wells are now drilling. Sill & Odell are trying their fortune a second time on 3779, this time in the southeast corner. The Gillis Farm Oil Co. have a mysterious venture on sub-division 2 of tract 1799. Armstrong, Boggs & Co. are drilling on 2027, west of the Murphy well on the same lands. A wildcat of the rankest character has been started on 2542, in Millstone township. The Wilcox Tannery Co. completed two more wells near Rolfe, on warrant 2676, McKean county, one of which was a dry hole and the other a small well. The National Transit Co. is starting several wells in the Wilcox gas field to make ready for the increased demand that the coming winter will make on its natural gas supply. Shannon, Kelley & Co. completed a dry hole on warrant 3825, a few miles south of Nebraska, in Greene township, Forest county.

THE LOWER COUNTRY.

There were 94 wells completed in the Lower country in August, 25 of which failed to find oil; the new production was 6401 barrels, an increase of 3 wells and of 4820 barrels production over the July figures. On the 31st of August the Lower country had 35 new rigs, 21 old rigs and 91 drilling wells, as compared with 40 new rigs, 25 old rigs and 90 drilling wells on the 31st of July.

VENANGO.—A considerable amount of new work is under way in the different sections of Venango. The activity in the Shamburg district continues, where 14 new wells were finished in August. Wilhelm & Kearney, on the Tarr, Dr. Shamburg, on the Shreve, Wilson Bros., on the Ankerhauser, and Culp & Stewart, on the Jordan, were rewarded with dry holes. There is very little doing at Tipperary and nothing at all at Tarkill, but Slab

Furnace and Mount Hope have both excited increased interest by reasons of favorable developments. Two dry holes were drilled at Red Valley in the effort to find an extension of the productive area westward. In the vicinity of Emlenton, in the old Bullion district and about Byrom Centre, a few wells are drilled from time to time that prove the old territory is not yet entirely exhausted. Venango completed 50 new wells in August, 14 of which were dusters. This is an increase of 10 wells over the record for July. At the close of August there were 22 new rigs and 24 drilling wells under way, as compared with 22 new rigs and 23 drilling wells at the close of July.

CLARION.—There is nothing new to report from Clarion county for the months of August and September. M. L. Lockwood & Co.'s test well in the Reidsburg section, northeast of the Pioneer well, on the Andrew Kifer farm, was a failure. Thus far the first well is the only one of any account that has been completed in the field. There is a small amount of drilling under way in the Cogley district.

BUTLER AND ARMSTRONG.

Phillips & Osborne's No. 6, on the Stewart farm, 400 feet northwest of No. 3, on the same farm, was producing 160 barrels per day on the 10th of August. When first drilled in to the upper pay streak on the night of August 26 it began flowing at the rate of 55 barrels per hour, and did this on several occasions after being agitated by the drill. Their No. 2 and No. 3 wells, on the Stahm farm, west of the gushers on the Stewart, are fair producing wells from the 100-foot sand. On the 10th of September No. 2 was producing 33 barrels and No. 3 52 barrels per hour. Phillips & Osborne's Nos. 5 and 6, on the Behm farm, north and northeast of the Lappe duster on the same farm, are the great gushers of the Reibold field. No. 5 is located along the eastern line of the farm and nearly due west of Markle No. 7. No. 6, on this farm, is 600 feet west of No. 5. The No. 5 on the Behm is credited with 160 barrels for its best hour's production, and during the first days of its brilliant career often ran above 100 barrels per hour when it was being agitated by the drill. On the afternoon of September 13 No. 6, Behm, reached the level of the second pay streak, and after an hour's drilling its production had increased to 130 barrels per hour. The gauge of September 10 gave Behm 5 a production of 2160 barrels for the 24 hours ending on that day. At this writing interest is centered in the wells on the Peiffer and Stahm farms, about a half mile ahead of the Behm farm gushers and on a line which is reported to have a magnetic bearing of north 75 degrees west. Phillips & Osborne have an important well drilling on the north side of Conoquenessing Creek and north of the wells on the Behm farm. According to the gauge by the scouts on the 10th of September the 86 wells in the Reibold field were producing 6425 barrels. The production since that time has reached about 9000 barrels in one 24 hours.

WASHINGTON.

The developments in the Taylorstown field since the last report was written for the AGE are of a bullish character. Hart Bros. & Co.'s well, on the Carrothers farm, southeast of the Blayney, is light and will not hasten the drill in the direction beyond this strike. A. B. Caldwell & Co. have a small producer on the eastern side of Buffalo creek and between Taylorstown and the B. & O. depot. At last accounts it was producing 10 barrels per day. Thayer & Co.'s well on the Buchanan farm, on the flats at Taylorstown, is twice as large as the Caldwell producer. The Anchor Oil Co.'s No. 2, on the

Cundall farm, one location down the creek from No. 1, started at 250 barrels, which makes for it a better record than No. 1 can show. The wildcat wells drilling at the southwest on the Miller and McLain farms will attract attention as they near the sand. The wildcatters are looking for an extension in this direction and northwest of the Woodburn farm well. The gushers of Reibold have blinded the eye of the speculator to the importance of the territory about McKeown's phenomenal producer on the Martin farm. According to Mr. Tupper's gauge on the 10th of September the six wells on the Fergus farm were together producing 2125 barrels, and McKeown's, Martin, 5 was down to 576 barrels. The well on the Davis farm, in advance of the Martin farm producers, looks like a small affair at this writing.

Below is a list showing the production of wells by groups on the different farms which make up the total of the Washington field for August 13 and September 10, 1887:

Farm.	Operator.	Number of wells, Aug. 13.	Production Aug. 13, Bbls.	Number of wells, Sept. 10.	Production Sept. 10, Bbls.
Gordon, P. L. & H. Co.		5	124	5	81
Hess, "		3	24	3	13
Weirich, Forest Oil Co.		2	52	2	43
Hall, "		4	50	4	37
Barre, "		13	652	13	616
Taylor, Union Oil Co.		7	191	7	191
Morgan, "		8	165	8	119
Davis, "		7	442	7	430
Dye, "		1	25	1	15
Workman, "		3	140	3	78
McGovern, "		1	25	1	25
Clark, "		1	2	1	1
Zelt & Curry, Associated Producers Co.		2	12	2	10
Wilcy & Martin, "		2	13	2	13
Gantz & Wiley, Citizens' Oil & Gas Co.		2	15	2	31
Weaver, "		2	12	2	22
Clark, Hallam & Co.		1	5	1	5
Taylor, Galligan & Young		2	25	2	40
Clark, R. H. Thayer & Co.		6	120	6	97
Munce, John McKeown		12	393	12	304
Martin, "		4	321	7	681
"		1	2040	1	576
Quail, "		1	5	1	5
Smith, Willets & Young & Chartiers O Co		6	81	6	81
Cameron, "		10	383	11	464
Wright, Chartiers O Co & F W Andrews.		3	77	3	73
Fergus, Chartiers Oil Co.		2	186	6	2125
Stewart, Fisher Oil Co.		1	50	1	33
Lead Lot, Marsh & Caldwell		1	22	1	22
" McKeever & Mulholland		1	12	1	15
Fair Grounds, Wheeling Oil Co.		3	67	3	43
Cradle Factory Lot, Miller		2	15	2	55
Hall Lot, Guiffey & Co.		1	5	1	5
Linn, Coast & Co.		3	45	3	48
Hayes & Weirich, Coast & Co.		2	18	2	19
Shirls, Shirls		3	25	3	32
Manifold, Pew & Emerson		2	53	2	50
Gabby, "		1	5	1	5
Martin, Central Oil Co.		4	133	4	145
McGahey, Mascot Oil Co.		4	82	4	81
Miller, (Bunghole well), Reid & Co.		-	-	-	-
Montgomery, McKinney & Co. & Robbins.		2	8	2	10
Thome, Chartiers Oil Co & F W Andrews.		1	5	1	0
Wade, B. B. Campbell		5	334	5	218
Weaver, Hart Bros.		1	12	1	12
Thome, Lee & Shank		2	38	2	30
Wilcy, Munhall & Co.		2	7	2	7
McKean & Van Kirk, Caldwell & Co.		2	3	2	13
Whittlesee, "		2	90	2	100
Watson, Butler & Co.		2	17	2	11
Martin, Allen & Co.		1	14	1	16
Munce, I Willets & Son		25	610	26	400
Montgomery, Montgomery & Co.		1	6	1	7
McNary, Craig & Co.		1	6	1	5
Welsh, Reed & Co.		1	30	1	28
Happer, Happer & Co.		1	10	1	10
TAYLORSTOWN.					
J & D McMannis, W Va Nat Gas Co.		2	140	2	141
Noble, "		2	376	2	315
Donohey, "		1	101	1	95
Carson, "		1	5	1	7
Flack, "		1	108	1	112
Hodgens, "		1	86	1	120
Carrothers, "		-	-	1	90
Blayne, Marshall Oil Co.		3	220	3	260
Carrothers, "		-	-	1	50
" Caldwell & Co.		-	-	1	10
Woodburne, F O Co & Craig		1	164	1	178
Cundall, Vandergrift, Reed & Aiken		1	208	2	395
Buchanan, Thayer & Co.		-	-	1	20
Total		201	8710	215	9389
Production					
Date.	No. of wells.	Barrels.			
August 13, 1887	201	8710			
September 10, 1887	215	9389			
Difference	14	679			

Prof. Phillips' Analyses of Natural Gas.

Prof. Francis C. Phillips, of the Western University, the specialist employed by the Geological Survey to make careful examination and tests of natural gas from different sections, has completed his report and a portion of it has been made public:

The gases tested were from the fields at Fredonia, N. Y., the Speechley, Sheffield, Kane and Wilcox fields in the northern part of the State; from Murrys ville, Baden, Raccoon Creek and Houston, near Canonsburg, from each of which fields gas for fuel purposes is now being supplied.

The essential part of the gas, viewed from the standpoint of its heating capacity, is in its richness in hydrocarbons or paraffins and character of them. As for instance the lower classes of paraffins yield a greater available heat than the higher ones. In but two instances did the percentage of paraffins stand below 90, at Baden 87.27 and at Houston 84.26. The others show: Fredonia, 90.05; Sheffield, 90.64; Kane, 90.01; Wilcox, 90.38; Speechley, 95.42; Murrys ville, 97.70; Raccoon, 90.09. The quantities of nitrogen and carbonic dioxide vary in each specimen, showing in largest quantities in the Houston sample, where the nitrogen was 15.30 per cent. of the whole.

HEAT UNITS.

The results of the analysis are best explained by the table showing the available heat units and equivalent of a quantity of gas in charcoal:

Gas Fields.	Available heat units per 100 cubic feet of gas.	Pounds of water at boiling point evaporated by 100 cubic feet of gas.	Pounds of pure charcoal, equal in heating effect to 100 cubic feet of gas.
Fredonia	32,421	133.30	8,845
Sheffield	28,430	116.89	7,756
Kane	29,319	120.54	7,909
Wilcox	28,102	115.54	7,667
Speechley	31,554	129.73	8,609
Murrys ville	26,321	108.22	7,181
Raccoon Creek	27,355	112.47	7,463
Baden	26,941	110.77	7,350
Houston	26,119	107.38	7,526

An impression prevails, based partly upon analytical data, and partly upon a supposed variation in the steam producing power, that natural gas is subject to constant fluctuations in composition. To what extent such fluctuations are liable to affect the value of the results of the above calculation, I am wholly unable to state.

In view of these reported changes it is to be regretted that more abundant data are not at hand upon which to base a conclusion as to the real nature of the fluctuations in composition.

THE Manufacturers' Natural Gas Co. are on the move all along the lines. The contract for laying the main line from Bradford to the great gassers at Kane has been awarded to Sheehan and Barney Kelley, who are laying the pipe as fast as it can be supplied by the Chester Tube Works, of Philadelphia. P. J. McMahon has the contract for digging the trenches in the city of Bradford. The Manufacturers' company are piping the city, and the fall pastures are not lengthening under their feet. It now looks as if Mr. Hequemburg would be ably assisted in furnishing the citizens of Bradford with "bed-clothing" during the coming winter.

J. B. McELWAINE is ably represented in Bradford and other oil region towns, but passes most of his time in Indianapolis and Findlay, Ohio, where he is meeting the demands of oil and gas men for hardware and oil well supplies. He has offices at 64 Maryland street, Indianapolis, and Findlay, Ohio.

A PITHOLE LEGEND OF J. WILKES BOOTH.

A. R. CRUM IN PITTSBURGH DISPATCH.

It is not generally known that J. Wilkes Booth, the assassin of President Lincoln, was at one time an oil producer, yet such is the fact, and the old-timers relate a singular coincidence of that time. Booth's visit to that section of the country in 1864 is well known, and a glass from the window of the McHenry House, at Meadville, on which he had written his name with one of his diamonds while stopping there, is preserved in Philadelphia. At the time of his visit the oil regions were at the highest stage of excitement, and, in fact, the whole country had gone daft and was in oil. Hundreds of oil companies had just sprung into life, and their shares were being eagerly taken at par, whether the figure was \$100 or only 50 cents a share. Some of them were bona fide stock companies representing valuable property and dozens of them were swindles, the shares not being worth the fine lithographic work on the certificates. Millions of dollars were invested by the people of Philadelphia, New York, Boston, Baltimore and everywhere else in oil stock, and millions were never seen again by speculators who were in such haste to get rich that they never paused to examine into the truth or falsity of the claims presented to them. Anything with oil or petroleum in the name of it was good enough for an investment in those days, though a great many people have never recovered from the shock which followed this unreasoning fever of speculation, and still look with suspicion upon anything and everything connected with the petroleum business, even to the persons now legitimately engaged in it.

BOOTH'S PURCHASE.

But Booth's investment was in none of these wildcat companies. He bought a thirteenth interest in the famous Homestead well at Pithole and paid therefor \$15,000 cash. The Homestead was a great well in its day, and produced a considerable quantity of crude petroleum and corresponding wealth for its owners, with oil selling at \$4 to \$5 at the well. Booth did not retain his interest long, but sold it. The Homestead floated a flag when the glad tidings of the ending of the war were telegraphed to Pithole, but that flag was never lowered to half mast in mourning for the martyred President. For the very night that Abraham Lincoln was shot by J. Wilkes Booth the Homestead well caught fire from a gas explosion, and when the sad news reached Pithole that wonderful mushroom city was overhung by a pall of black smoke from the burning well. When the citizens of Oil City and Titusville went out the next morning to hang crape about their dwellings and places of business they could see the black pillar standing against the sky over Pithole.

True, Booth did not own any part of the well when it was burned, nor for some time before, but the coincidence was generally remarked and the superstitious shook their heads and declared the hand of Providence was in the affair. The flag, so proudly flying to the breeze a few days before, was burned with the well, and the half-masted, bright new flags in the city, which flaunted their brilliant colors

WHEN PEACE WAS ASSURED,

were grimed by the volumes of thick smoke from the well in which the assassin had once owned an interest. The incident, remarked at the time, was soon lost sight of in the wild excitement of the days, but still lingers in the memory of many of the pioneer oil men, and is occa-

sionally told by some forge fire in a derrick or by the gas fire in the stove of some "wildcat" boarding house to a group of men who have made acquaintance with oildom since those stirring days.

It was just after this time that the late martyred President Garfield championed the cause of the oil producers, and urged the abolishment of the tax on crude petroleum, which he declared was unjust and impolitic. As an article of growing export, he contended that its production should be encouraged, and his pleadings were effective in having the tax first reduced and then abolished altogether. It is related in this connection that at the election in 1880 an aged, white-haired man limped up to the polling place in an oil region town, held aloft his ticket, proposed three cheers for Garfield in a tremendous voice, and after cheering as lustily as he could, deposited what he declared to the crowd was the first ballot other than Democratic he had ever cast, and all because of Garfield's efforts to have the burdensome tax taken off crude petroleum 15 years before.

The change in the oil country in its business methods and general condition since 1865 has been as great and complete as was the change in that week from the manifestations of rejoicing over the close of the war to those of sorrow over the violent death of the beloved Lincoln. Twenty-two years ago oildom was a

LAND OF EXCITEMENT,

hap-hazard and wild speculation. It is now one of careful and provident business calculation, and just at present suffering from a depression and quiet most completely in contrast with the rush and reckless whirl of 20 years ago. The aggregate transfers of oil property during the past three months would not equal in amount the transfers of a single day at the time Wilkes Booth made his investment in the Homestead well. If compared with some particular days of that time the past year would not reach an equal amount. Yet the big wells of Pithole were but poor rivals of the great "gushers" of the Washington field to-day. The total investment of producers in the Washington field, including the drilling of wells and purchase of lands, has been less than \$2,000,000. The total investments at Pithole exceeded \$25,000,000. Washington will produce more than twice as much oil as Pithole did, but the product will sell for less than half as much money. These figures depict pretty clearly the contrast between the present and the time when Wilkes Booth was an oilman. Perhaps they will convey to the average mind the difference more effectually than anything else could between the time when the first pipe line was laid and guarded against the assaults of indignant teamsters and the achievement of practical perfection in the operation of the methods of transportation by pipe lines.

A LARGE gasser was struck September 10, 4:30 o'clock, by the Pennsylvania Natural Gas Co. on the William Boyce farm at Canonsburg, Washington county. On the same day the Shenango Natural Gas Co., of New Castle, opened up an immense gasser in the New Sheffield district, in Beaver county. The well is 1250 feet deep and is within 50 yards of Allequippa station on the P. & L. E. road. A line is being laid to New Castle.

THE Excelsior Oil Co., of Oil City, Pa., has purchased the Buffalo Lubricating Co.'s works, Buffalo, N. Y., for \$60,000.

A 50-barrel well is reported at Royal Centre, Cass county, within 10 miles of Logansport, Indiana. Oil was found at Black River, Michigan, September 8, in a well drilling for gas.

August Production Report.

Reports of stocks at wells received by THE PETROLEUM AGE show an average decrease of 2.0 barrels to the well in the Bradford and of 1.1 barrels to the well in the Allegany field during the month of August. The total number of wells connected with the pipe lines September 1st was estimated at 14,100 in the Bradford and 4000 in the Allegany field. Taking the above figures as the basis of an estimate on the daily production, stocks in tanks at wells were decreased at the rate of 1052 barrels a day in the Bradford and Allegany fields. The total daily runs in both fields averaged 26,447 barrels a day in August. Subtracting the reduction in stocks, the Bradford and Allegany production averaged 25,395 barrels a day in August, which may be placed at 3,895 barrels a day for the Allegany and 21,500 barrels a day for the Bradford field.

THE JULY REPORT.

Stocks at wells showed an average increase of .2 barrels to the well in the Bradford and a decrease of 4.6 barrels to the well in the Allegany field during the month of July. The total number of wells connected with the pipe lines August 1st is estimated at 14,100 in the Bradford and 4000 in the Allegany field. Taking the above figures as the basis of an estimate on the daily production, stocks in tanks at wells were decreased at the rate of 394 barrels a day in the Bradford and Allegany fields. The total daily runs in both fields averaged 25,894 barrels a day in July. Subtracting the reduction in stocks, the Bradford and Allegany production averaged 25,500 barrels a day in July, which was placed at 4000 barrels a day for the Allegany and 21,500 barrels a day for the Bradford field.

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

Field.	No. Wells Aug. 1.	No. Wells Sept. 1.	Average per well Aug. 1.	Average per well Sept. 1.
Clarendon and Tiona	106	106	21	21
Cherry Grove	22	22	35	35
Cooper District	131	131	31	33
Lower Country	231	233	88	79
Miscellaneous	224	227	62	68

Accepting the outside runs, which are made up of the producing fields outside of Bradford and Allegany, as representing the production outside of those two fields, an estimate on the yield for July and August is as follows:

Field.	August. Barrels.	July. Barrels.
Bradford	21,500	21,500
Allegany	3,895	4,000
Outside Runs	33,726	34,505
Total	59,121	60,005
Macksburg	900	880
Total with Macksburg	60,021	60,885
Decrease per diem	864	---

This represents a decrease in production of 18,207 barrels per day when compared with the figures for August, 1886.

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region, with the exception of Bradford. The Lima runs by the Buckeye Pipe Lines were 15,834 barrels a day in August, 12,580 barrels a day in July, 15,818 barrels in June, 14,486 barrels in May, 11,760 barrels in April, 9777 barrels in March, 7394 barrels in February, and 4226 barrels in January.

The following table shows the comparative production for 1884, 1885, 1886 and 1887:

	Bradford.		Allegany.		Outside Runs.		Total Prod.	
	1885.	1884.	1885.	1884.	1885.	1884.	1885.	1884.
January	23,675	31,806	8,260	11,264	18,594	16,140	55,529	59,240
February	27,051	32,378	7,196	11,607	19,800	18,561	54,047	62,546
March	26,444	31,912	7,342	11,768	19,923	19,764	53,709	63,444
April	27,413	32,442	7,169	11,848	23,067	19,162	57,649	63,452
May	27,231	33,922	7,049	11,547	21,225	19,549	55,505	65,018
June	29,272	33,753	7,463	11,108	21,559	19,977	58,294	64,838
July	30,309	34,031	7,139	11,218	19,273	20,870	56,721	66,119
August	29,858	33,353	7,065	10,384	18,608	22,830	55,531	65,567
September	30,205	32,976	7,186	9,877	21,269	22,514	58,660	65,367
October	30,180	31,758	6,747	9,356	23,161	22,762	60,088	63,876
November	31,355	31,789	7,002	8,642	23,087	23,557	61,444	63,988
December	29,223	29,516	6,196	8,193	24,184	22,918	59,603	60,297
1886.	1885.	1886.	1885.	1886.	1885.	1886.	1885.	1886.
January	23,677	28,675	6,378	8,260	22,217	18,594	57,272	55,529
February	28,586	27,051	6,651	7,196	22,603	19,800	57,840	54,047
March	27,947	26,444	6,137	7,342	25,680	19,923	59,764	53,709
April	27,807	27,413	6,527	7,169	28,693	23,067	63,027	57,649
May	27,148	27,231	6,535	7,049	34,515	21,225	68,198	55,505
June	27,860	29,272	6,554	7,463	40,040	21,559	74,454	58,294
July	27,046	30,309	6,350	7,139	40,491	19,273	73,887	56,721
August	26,695	29,858	6,200	7,065	43,762	22,830	76,657	55,531
September	26,674	30,205	5,994	7,186	45,560	21,269	78,228	58,660
October	25,454	30,180	6,017	6,747	45,538	23,161	77,009	60,088
November	24,503	31,355	5,860	7,002	40,817	23,087	71,180	61,444
December	22,422	29,223	5,178	6,196	38,783	24,184	66,383	59,603
1887.	1886.	1887.	1886.	1887.	1886.	1887.	1886.	1887.
January	23,269	28,677	5,563	6,378	34,254	22,217	63,086	57,272
February	22,930	28,586	5,049	6,651	35,745	22,603	63,724	57,840
March	22,327	27,947	4,930	6,137	36,135	25,680	63,392	59,764
April	21,880	27,807	4,447	6,137	37,120	28,693	63,447	63,027
May	21,995	27,148	4,500	6,535	36,758	34,515	63,253	68,198
June	22,000	27,860	4,337	6,554	35,938	40,040	62,275	74,454
July	21,500	27,046	4,000	6,350	34,505	40,491	60,005	73,887
August	21,395	26,695	4,000	6,200	33,726	43,762	59,121	76,657

The Refined Market.

The advance in crude was followed by an increased demand for the refined article, but prices suffered no material change. The quotation for 70° Abel test, in barrels, was marked up from 6½¢ to 6½¢ on the 1st of August, which was followed by another advance of ½¢ of a cent on the 12th. On the 18th the ½¢ of a cent was taken off and the figures kept at 6½¢ for the remainder of the month. Orders came in freely when the crude market rallied above the 60-cent point and a large business was transacted.

The foreign markets underwent few changes. The Antwerp market strengthened somewhat toward the close of the month, while prices at Bremen and London remained about the same.

are offered at 6¾¢ for 110° test Standard white, 7¢ 7¼¢ for 120° test Standard white, 7½¢ for 130° test Standard white, and 8¼¢ for 150° test water white. Western naphtha 68° to 72° test is quoted at 7½¢ delivered in New York.

Refined in cases is in increased demand. The price for plain tops remains unchanged at 8½¢ per gallon. The clearances for August in this class of goods to China and the East amounts to 1,006,761 cases, an increase of 456,845 cases over the same month in 1886. The total clearances to Aug. 31, 1887, are 7,461,367 cases, a decrease of 1,801,468 cases, as compared with the corresponding period of the year preceding.

Mr. George H. Lincoln's monthly circular gives the following figures on the clearances of refined petroleum, in cases, for China and the East up to the 31st of August, for the years 1886 and 1887:

	1887. Cases.	1886. Cases.
China	1,309,562	2,359,007
Japan	1,983,669	1,176,654
India	1,995,573	2,954,042
Java, Singapore, etc.	2,172,563	2,773,132
Total August 31st	7,461,367	9,262,835
Total July 31st	6,454,606	8,712,919
Clearances for August	1,006,761	549,916
Clearances for July	852,078	1,028,427
Clearances for June	1,084,921	1,471,362
Clearances for May	949,574	1,112,522
Clearances for April	1,085,363	742,478
Clearances for March	1,157,823	2,058,609
Clearances for February	733,626	1,281,488
Clearances for January	591,221	1,018,033
Total	7,461,367	9,262,835

William H. Samuel & Co., of Liverpool, England, report the visible supply of refined petroleum on August 1st as follows:

	Barrels.
Europe (7 Continental ports).....	1,631,217
London.....	235,302
Liverpool.....	103,953

Total.....1,969,519

The following estimate is made in regard to amount required for deliveries from October to December of the present year:

	Barrels.
Europe (7 Continental ports).....	1,942,456
London.....	213,746
Liverpool.....	112,953

Total.....2,269,155

Estimated stock on hand October 1.....503,589

Estimated demand for last 3 months of present year.....1,465,566

The same parties say: Russian oil promises to occupy an increasingly important position during the coming season. The quality has undergone considerable improvement, and as there appears to be a plentiful supply, the consumption of Russian oil may be expected to considerably exceed that of last season.

The exports of refined, crude and naphtha, from all ports, from January 1 to September 3 have been as follows:

	1887. Gallons.	1886. Gallons.
From Boston.....	2,875,035	3,579,572
Philadelphia.....	108,511,880	99,101,648
Baltimore.....	5,859,632	11,908,637
Perth Amboy.....	10,424,592	2,394,236
Total.....	127,671,119	117,984,093
From New York.....	249,283,877	261,043,377

Total exports from United States...376,955,036 379,027,470

Refined for the home trade is in better demand with prices as follow: 8¼@8¾c for New York State legal test, 7@7¼c for 110° test, 7¼@7¾c for 120° test, 7½@7¾c for New York city 110° flash, and 8½@8¾c for New York city 150° water white. Western lots

REFINED QUOTATIONS FOR AUGUST.

	New York.....	Philadel- phia.....	Baltimore.....	London and Liverpool.....	Bremen.....	Antwerp.....
	Cts.	Cts.	Cts.	Pence.	Marks.	Francs.
1.....	6½	6½	6½	5½	6.00	15
2.....	6½	6½	6½	5½	6.00	15
3.....	6½	6½	6½	5½	6.00	15
4.....	6½	6½	6½	5½	6.00	15
5.....	6½	6½	6½	5½	5.90	15
6.....	6½	6½	6½	5½	5.90	15
7.....	6½	6½	6½	5½	5.90	15
8.....	6½	6½	6½	5½	5.90	15
9.....	6½	6½	6½	5½	5.90	15
10.....	6½	6½	6½	5½	5.90	15
11.....	6½	6½	6½	5½	5.90	15
12.....	6½	6½	6½	5½	5.90	15
13.....	6½	6½	6½	5½	5.90	15
14.....	6½	6½	6½	5½	5.95	15
15.....	6½	6½	6½	5½	5.95	15
16.....	6½	6½	6½	5½	5.95	15
17.....	6½	6½	6½	5½	5.95	15
18.....	6½	6½	6½	5½	5.95	15
19.....	6½	6½	6½	5½	5.95	15½
20.....	6½	6½	6½	5½	5.95	15½
21.....	6½	6½	6½	5½	5.95	15½
22.....	6½	6½	6½	5½	5.95	15½
23.....	6½	6½	6½	5½	5.95	15½
24.....	6½	6½	6½	5½	5.95	15½
25.....	6½	6½	6½	5½	5.95	15½
26.....	6½	6½	6½	5½	5.95	15½
27.....	6½	6½	6½	5½	5.95	15½
28.....	6½	6½	6½	5½	6.00	15½
29.....	6½	6½	6½	5½	6.00	15½
30.....	6½	6½	6½	5½	6.00	15½
31.....	6½	6½	6½	5½	6.00	15½

THE Archer Gas Fuel Co., of Terre Haute, Indiana, has been organized with a capital stock of \$500,000. It proposes to manufacture a fuel gas, if natural gas can not be obtained in large quantities.

MR. JOHN F. CARLL has gone to Arkansas to investigate the geological structure of the Arkansas oil basin.

Crude Market for August.

The oil market showed some improvement for August when contrasted with the month preceding, and toward the end of the month it was apparent that a further strengthening of values was close at hand. The new wells about the McKeown gusher at Washington were made the pretext for several very sudden breaks, but the speedy falling off in their production made them of momentary interest. There is still room for more of the same class in the wonderful white sand territory of Washington county, but seeking for them is the most hazardous kind of gambling in existence. The situation in the oil fields of Northwestern Ohio remains unchanged. Operations have been materially curtailed by the last cut in prices, and conflicting reports are still circulated in regard to the quality of the oil. The secret organization of Pennsylvania producers has grown rapidly, but no plan of action on their part has yet been put in working shape.

The month of August opened with 57½c bid in New York, 58c in Pittsburgh, 58¼c in Bradford and 58¾c in Oil City, and values gained strength until 59½ was reached. A reaction then set in and the market went down as far as 56¾c on the 3rd, which was the lowest quotation of the month. On the 10th the 60c point was again touched for a few moments at Oil City and Pittsburgh, but values did not get out of the fifties, for good and all, until the 22nd. On the 12th 60¾c was the highest quotation, and on the 16th values had ascended to the 62½c point. There was another weakening on the 19th below 60c, but 58¾c proved the turning point for the upward move that culminated at 65c on the 31st. The month closed firm at 64½c bid in Bradford, New York and Oil City and 64¾c in Pittsburgh. The highest quotation for July was 61½c and the lowest 54c.

The range of prices for August was 8¼c, as compared with 7¾c in July, 3½c in June, 5¾c in May, 6¾c in April, 4c in March, 9¾ in February, and 4¾c in January. The average price on the floor of the Bradford Exchange was 60c in August, 59¼c in July, 62½c in June, 64c in May, 64½c in April, 63¼c in March, 63¾c in February and 71c in January. The average price for August one year ago was 62c.

THE CLEARANCES.

	August. Barrels.	July. Barrels.
Bradford Oil Exchange.....	20,414,000	10,808,600
Oil City.....	39,238,000	24,498,000
New York Consolidated Exchange.....	85,926,000	69,788,000
Pittsburgh Petroleum Exchange, est.....	41,715,000	26,810,000
Philadelphia Oil Exchange, est.....	8,000,000	6,597,000
Total.....	195,293,000	138,501,000

A Played-Out Gas Well.

The gas well at Lawrenceburg, Indiana, which created so much enthusiasm among the citizens, exhausted itself in about three days. The flow was found at a depth of 200 feet, and on September 9 the gas was lighted and made a good display, producing two flames about 35 feet in height from two 2½-inch pipes. The following night the flame had dwindled to five feet in height and soon reduced itself to nothing at all.

SUITS have been instituted in the Hamilton county, Indiana, courts against the Standard Oil Co. for false representations in securing leases of land. The owner of the ground on which the big Sumach gas well is located alleges that the Standard secured the ground by representing that oil wells would be sunk and that gas had no market value. The leases secured by the old Indiana drilling company, which were turned over to Standard, will probably lead to litigation.—*Indianapolis News.*

AUGUST OPERATIONS.

THE ENTIRE REGION—WELLS COMPLETED, WELLS DRILLING, AND RIGS UP AND BUILDING.

WELLS COMPLETED IN AUGUST, 1887.

Allegany Field.

Twp.	Owner.	Barrels.
Wirt, 60,	Rollin Dow	4
Genesee, 24,	Wheeler & Dusenbury	5
Clarksville, 3,(Jordan)	Augell Oil Co No 5	5
Wells completed		3
Production		14
Dry		0

Bradford Field.

East and West Branches.

2268, R. J. Straight	No 25	6
Rutherford, J T Jones	No 51	8
"	No 52	10
"	No 53	10
"	No 54	10

Kendall Creek.

Melvin, P C L & P Co	No 105	10
"	No 106	10
"	No 107	10
"	No 108	10

Indian Creek.

W & M, McKinney Bros	No 10	8
Wells completed		10
Production		92
Dry		0

Warren and Forest.

GLADE AND OTHER TOWNS.

Kinzua Village.

Hodge, Morse estate		dry
Weed, " No 12		50
" " No 13		50
" McCalmont & Morse	No 11	50
White, Morse estate	No 12	25
5563, Smith, Bright & Co	No 13	dry
Johnson, Sill & Odell	No 7	100
Glade twp, (Gardner)	Joe Magee	dry
Cornplanter Run, Brown Bros & Ne-smyth		dry
Near Irvineton, (John Lee) Gilmor & Johnson		dry
Wells completed		10
Production		275
Dry		5

Clarendon.

Stonchill, Nutting & Co	No 8	5
33, D McKelvy & Co	No 6	5
85, Hazeltine & Bell		5
465, Fred Hue	No 15	6
555, H Simpson & Co		4
Wells completed		5
Production		25
Dry		0

Tiona.

82, J L McKinney & Co		5
82, " "		5
103, " "		5
165, Helm & Mealey		5
319, (Sheffield) Horton, Cray & Co		gas
Wells completed		5
Production		20
Dry		1

Balltown.

3195, Proper Reserve Oil Co		10
Green, J C Welsh		dry
Wells completed		2
Production		10
Dry		1

Grand Valley.

Zane, National Oil Co	No 17	10
" " " "	No 18	10
Emerson, L B Wood & Co		10
Knapp, " "		4
Lot 150, Nelson Farrel	No 14	8
Lot 142, Holman & Hopkins		5
Blakeley, C W Scofield	No 10	6
Proper, Bovee & Duck	No 5	8
" " " "	No 6	5
Breen, John Breen		5
Hayes, J I Dunn & Co		dry
Henderson, City Oil Co		3
Chapple Hill, Grand Valley Gas Co		gas
Lot 151, Dibble & Mitchell	No 2	2
" " " "	L B Wood & Co	No 10
Enterprise, J P Cappeau & Co		2
Whaley, Thomas Cummings		dry
Wells completed		17
Production		80
Dry		3

Miscellaneous—Elk County, Etc.

2676, (McKean) Wilcox Tannery Co		5
Rolfe, " "		dry
2025, (Elk) Clark & Foster	No 1	5
2033, " Porter, Thyng & Co	No 10	10
2033, " Highland Oil Co	No 3	10
3325, (Forest) Shannon syndicate		dry
Wells completed		6
Production		30
Dry		2

Lower Country.

Venango and Other Sections.

Farm.	Operator.	Barrels.
McBride, Thomas Smith		5
Holiday Run, Braunschweiger		8
" " " "	B F Brundred	6
Reno, S Y Ramage		6
Niagara, Henry Wilbur		3
Kirkwood, Kirkwood & Co		dry
Buchanan, Rouseville Oil Co		10
W P McCray, McCray		5
Kaufman, Judd & Geizer		6
Walnut Bend, Trax & Simmons		dry
" " " "	J H Oberley	dry
Haggerty, Ritts & Co		5
Salem, J B Smithman		5
Raymilton, (Henderson) A T Krepps		dry
" (Raymond) J J Doyle		6
" (McClelland) " "		8

Vicinity Pleasantville.

Talman, W P Black	No 5	15
" " " "	No 6	20
Fleming, " "	No 4	10
Daily, " "	No 3	8
A W Brown, " "	No 1	3
Tallman, T C Joy & Co		6
Poor, " "	No 2	4
Alkora, McKinney & Co	No 1	10
Tarr, Wilhelm & Kearney	No 4	dry
Shreve, Dr Shamburg		dry
Dawson, White & Krafert	No 6	3
Ankerhauser, Wilson Bros		dry
Jordan, Culp & Stewart		dry
Siggins, Siggins & Son		3

Tipperary, Hall's Run, Etc.

Humboldt, Taylor, Torrey & Murphy		8
Phil & Bost, Gates & Doty	No 1	3
" " " "	Goodrich & Salisbury	3
Mays, Morarity, Cooper & Co		5
Forman, Mitchell & Steele		dry
Slab Furnace, Warner		8
" (Glass) Wood & Co		dry
Hirsch, Williams & Richards		dry

Rockland or Red Valley.

Jas Pa son, Crawford & Co		dry
Richardson, Piper & White		dry

Mt. Hope and Smoky District.

S & G, Sheasley & Galbraith	No 2	10
Miller, Galbraith & Co	No 3	4
Galbraith, Shepard & Galbraith		8

Vicinity Emlenton.

Emlenton, Porterfield & McComb		5
J W Smith, J W Smith		5
T Grant, Wilson Bros & Co		10

Bullion.

Hovis, Hovis & Co		4
Crawford, Hoffman & Co		dry
Byrom Centre, (Grant) Edwards & Co		20
" (Flynn) Flynn & Brown		8
Wells completed		50
Production		256
Dry		14

Clarion.

Widdiken, Berlin & Son	No 1	10
Kahle, " "	No 2	8
Shippen, John J Carter	No 9	10
De oe, Kribbs & Co		3
Wagner, Hahn & Wagner		dry
Reidsburg, M L Lockwood & Co		dry
Brinker, Riddle & Co		dry
Deitrich, J D Wolfe		dry
Wells completed		8
Production		41
Dry		4

Butler and Armstrong.

Stewart, T W Phillips & D Osborne	No 6 (est)	600
Dickey, T W Phillips & D Osborne	No 2 (est)	25
Markle, T W Phillips & D Osborne	No 12 (est)	50
Stahm, T W Phillips & D Osborne	No 3	100
Stahm, T W Phillips & D Osborne	No 2	40
Behm, T W Phillips & D Osborne	No 4	50
Craigtown, Guffey & Co (for gas)		dry
Rogers, Jos Hartman & Bros		dry
Duffey, Dav s Bros	No 2	dry
Hickey, Boyd & Co	No 7	8
Houton, Davis Bros & Co		3
Kiltensbaugh, McTamany & Co	No 1	10
Guthrie, Thomas & Co		dry
Robinson, J Gorman		12
Story, Hazlewood Oil Co (est)		10

St. Joe.

Bippus, Phillips		dry
Zang, Hartman		8

Thorn Creek.

Bulford, Iman & Co	No 2	10
Bulford, Kingensmith	No 2	8

Wells completed		19
Production		934
Dry		5

Washington.

Martin, McKeown	No 6	200
" " " "	No 7	1000
Cameron, Chartiers Oil Co	No 11	240
Fergus, " "	No 3 (est)	750
" " " "	No 4 (est)	480
" " " "	No 5 (est)	1450
" " " "	No 6 (est)	500
Weaver, C O & Gas Co	No 4	25
Davis, Union Co	No 6	100
Martin, Central Oil Co	No 4	25

Taylorstown.

Hodgens, West Virginia Natural Gas Co		130
Noble, " "	No 2	170
W B Carrothers, Hart Bros	No 1	50
Carrothers, Caldwell & Co		dry
Blaney, Marshall Oil Co	No 3	40

Wells completed		15
Production		5160
Dry		1

Shannopin.

Stone, J M Guffey & Co		10
Moundsville, J W Craig & Co		dry

Wells completed		2
Production		10
Dry		1

DRILLING WELLS.**RIGS UP AND BUILDING AUGUST**

31, 1887.

Allegheny Field.*Scio.*

Lot.	Owner.	Depth.
3,	Coyle & Simon (old).....	rig
12,	Allen & Morse (old).....	rig
12,	Griffin & Co No 10 (old).....	rig
50,	Pease & Coyle No 9 (old).....	rig
46,	L. G. Norton No 4 (old).....	rig
New rigs.....		0
Old rigs.....		5
Drilling.....		0
Total.....		5

Alma.

3,	M J McMullan & Co No 5 (old).....	rig
23,	Vance & Horton (old).....	rig
26,	Willetts & Elliott (old).....	rig
51,	Sawyer & Co (old).....	rig
120,	McCalmont Oil Co No 10 (old).....	rig
New rigs.....		0
Old rigs.....		5
Drilling.....		0
Total.....		5

Wirt.

25,	Empire Gas Co (for gas).....	drilling
41,	Glenn Oil Co.....	drilling
44,	Allegheny Gas Co (for gas).....	drilling
55,	P M Shannon & Co (old).....	rig
52,	(Jacob Jordan) Wilson & Johnston No 9 (old).....	rig
61,	(J Jordan) Ackerly, Barton & Co (old).....	rig
61,	(Isaiah Jordan) Lester, Jordan & Co No 6 (old).....	rig
61,	" " No 7 (old).....	rig
62,	(Peterson) Limekiln Club No 4 (old).....	rig
62,	(Latham) " No 1 (old).....	rig
New rigs.....		0
Old rigs.....		7
Drilling.....		3
Total.....		10

Bolivar.

12,	Wood & Co (old).....	rig
23,	F C Streeter & Co No 12 (old).....	rig
New rigs.....		0
Old rigs.....		2
Drilling.....		0
Total.....		2

Genesee.

14,	Merwin (old).....	rig
22,	I Willetts No 14 (old).....	rig
22,	" " No 15 (old).....	rig
22,	" " No 16 (old).....	rig
22,	" " No 17 (old).....	rig
22,	" " No 18 (old).....	rig
23,	Coughlin (old).....	rig
29,	William Cranston (old).....	rig
8,	I Willetts.....	drilling
New rigs.....		0
Old rigs.....		8
Drilling.....		1
Total.....		9

Clarksville.

3,	National Transit Co No 89 (for gas).....	drilling
2,	National Transit Co No 90 (for gas).....	rig
10,	Angell Oil Co.....	rig
5,	Lane, Lane Oil Co No 7 (old).....	rig
6,	(Seever) Ackerly, Barton & Co No 9 (old).....	rig
9,	Heuston & Brecht No 4 (old).....	rig
9,	Merriitt (old).....	rig

10,	(Smith) Fritz & McKelvy (shut down).....	500
5,	(Weatherbee) Barton & Ackerly (old).....	rig
New rigs.....		2
Old rigs.....		6
Drilling.....		1
Total.....		9

Bradford Field.*East and West Branches.*

Mack,	Columbia Oil Co (old).....	rig
Mack,	Fisher Oil Co No 19 (old).....	rig
Paton,	McClure & Co (old).....	rig
Clark,	McCray Bros (old).....	rig

Quintuple.

25,	O H Strong (old).....	rig
44,	J W Humphrey (old).....	rig
260,	E T Howes (old).....	rig
New rigs.....		0
Old rigs and shut down.....		7
Drilling.....		0
Total.....		0

Kendall Creek.

Melvin,	P C L & P Co No 109.....	drilling
"	" " No 110.....	drilling
"	" " No 111.....	rig
"	" " No 112.....	rig

New rigs.....		2
Old rigs.....		0
Drilling.....		2
Total.....		4

Knapp's Creek.

Matthews,	C B Whitehead No 6 (old).....	rig
Borden,	T P Thompson (old).....	2 rigs
Sprague,	W Sprague No 1.....	500
New rigs.....		0
Old rigs.....		3
Drilling.....		1
Total.....		4

Foster Brook.

E T Co,	Kervin & Co No 10 (old).....	rig
"	" " No 11.....	drilling
C B & H,	Juter & Yager (old).....	rig
"	Clark, Cooper & Co No 9.....	drilling
"	Burns & Monroe (old).....	rig
"	Watson Oil Co No 52.....	drilling
"	" " No 53 (old).....	rig
New rigs.....		0
Old rigs.....		4
Drilling.....		3
Total.....		7

Four Mile.

Van Campen,	Coldren & Vance (old).....	rig
"	Jas K Van Campen No 3 (old).....	rig
Dye,	Manhattan Oil Co No 5 (old).....	rig
Stevens,	Stevens Bros No 3.....	drilling
New rigs.....		0
Old rigs.....		3
Drilling.....		1
Total.....		4

Indian Creek.

Hamlin,	M B Squiers No 4 (old).....	rig
Gale,	Barden, Cook & Dodd No 4.....	drilling
W & M,	Dusenbury & Wheeler.....	3 rigs
New rigs.....		3
Old rigs.....		1
Drilling.....		1
Total.....		5

Cole Creek.

Warrant	2263, Union Oil Co No 6 (old).....	rig
"	" " 2263, " " No 7 (old).....	rig
Bingham,	lot 369, Bennett & Thompson No 11 (old).....	rig
"	lot 477, Tueker & Rolfe No 3 (old).....	rig
"	lot 545, C P Byron No 14.....	100
New rigs.....		0
Old rigs.....		4
Drilling.....		1
Total.....		5

Kinzua.

Guffy & Hulings,	Union Oil Co No 73 (old).....	rig
Lot 128,	Newell & Quigley No 4.....	1400
"	" " No 5.....	rig
New rigs.....		1
Old rigs.....		1
Drilling.....		1
Total.....		3

Miscellaneous.

Port Allegheny,	Arnold, Dolley & Co (for gas).....	drilling
New rigs.....		0
Old rigs.....		0
Drilling.....		1
Total.....		1

Warren and Forest.**GLADE AND OTHER TOWNS.***Kinzua Village.*

Hodge,	Morse estate No 3.....	rig bldg
"	" " No 8.....	rig
White,	" " No 13.....	drilling
5555,	Collins & Phillips.....	rig bldg
Sugar Grove,	Sugar Grove Gas Co.....	drilling
New rigs.....		3
Old rigs.....		0
Drilling.....		2
Total.....		5

Clarendon.

35,	Henderson & Murphy.....	drilling
105,	Haekett & Shirley.....	drilling
105,	Tueker & Co (old).....	rig
532,	C A & D Cornen No 4.....	1000
532,	" " No 5.....	rig
556,	J A Waterhouse & Co No 25 old.....	rig
556,	" " No 26 old.....	rig
556,	" " No 27 old.....	rig
558,	Goal Bros No 6.....	rig
562,	" " No 6.....	rig
New rigs.....		3
Old rigs.....		4
Drilling.....		3
Total.....		10

Tiona.

103,	J L McKinney & Co.....	drilling
206,	John J Carter.....	drilling
201,	Wesley Chambers.....	drilling
284,	Watson & Mitchell No 8 (old).....	rig
New rigs.....		0
Old rigs.....		1
Drilling.....		3
Total.....		4

Cooper District.

407,	Shank & Stewart No 9 (old).....	rig
407,	" " No 13 (old).....	rig
New rigs.....		0
Old rigs.....		2
Drilling.....		0
Total.....		2

Balltown.

3194, Porcupine Oil Co No 39 (old).....	rig
3195, (Crisman) N F Clark No 14 (old).....	rig
New rigs.....	0
Old rigs.....	2
Drilling.....	0
Total.....	2

Kane.

343, (Looker) Ernhout & Co No 3.....	drilling
Kane, (Griffith lot) Blood & Co (for gas).....	drilling
344, Treat & Mallory No 8 (old).....	rig
420, Coast & Sons No 24 (old).....	rig
3767, Union Oil Co (old).....	rig
New rigs.....	0
Old rigs.....	3
Drilling.....	2
Total.....	5

Grand Valley.

Phil lands, Crippens & Phillips No 6 (old).....	rig
Campbell, National Oil Co No 18 (old).....	rig
" " " No 19 (old).....	rig
" " " No 20 (old).....	rig
Hunter, " " No 11 (old).....	rig
" " " No 12 (old).....	rig
" " " No 13 (old).....	rig
Reeves, " " No 4.....	drilling
Huidekooper, L B Wood & Co (old).....	rig
Lot 150, Nelson Farrell No 15.....	100
" 136, G P Kepler & Co (old).....	rig
" 137, " " (old).....	rig
" 238, J B Jennings & Grandin (old).....	rig
Blakeley, C W Seofield No 11.....	rig bldg
White, M Stewart & Co No 3.....	200
Lot 346, (Reno pur) A W Parker.....	rig
New rigs.....	2
Old rigs.....	11
Drilling.....	3
Total.....	16

Miscellaneous—Elk County, Etc.

1799, sub 2, Gillis Farm Oil Co., No 1 (shut down).....	sand
2032, Boggs, Rosenberg & Co No 4.....	drilling
2032, " " No 5.....	rig
2027, Armstrong & Boggs, No 1.....	1900
2033, Clark & Foster No 8.....	rig
3661, " " No 5 (old).....	rig
2033, Highland Oil Co No 4.....	1900
2033, " " No 5.....	rig
2033, Porter, Thyng & Co No 8.....	1875
2027, Mike Silk & Co No 1.....	rig bldg
2676, Wilcox Tannery Co.....	drilling
2686, Armstrong & Co (old).....	rig
Crawford, Sill & O'Dell No 2.....	drilling
2542, Millstone twp, Welsh & Wallace.....	drilling
Freeman's Station, Knox Bros.....	1100

Harmony Township, Forest County.

Joslyn, Wood & Stewart No 2.....	sand
McNutt, Bovee & Duek No 1.....	drilling
Kepler, Kernochan Bros No 2.....	rig
New rigs.....	5
Old rigs.....	2
Drilling.....	11
Total.....	18

*Lower Country.**Venango and Other Sections.*

Haliday Run, Braunschweiger No 2.....	rig
Cornplanter Run, Ross.....	sand
Osmer, Galbraith & Parker (old).....	rig
Rynd, Wratten & Co (old).....	rig
Columbia, Columbia Oil Co No 176.....	rig
Kirkwood, Kirkwood & Co.....	rig bldg
Buchanan, J H McCandless No 10.....	drilling
Geo Wratten, Curtis.....	rig
H McClintock, McComb Bros.....	rig
Curtis, Thomas Smith.....	rig bldg
Blood, P Bankson.....	rig
Reno, Reno Oil Co.....	drilling
Pioneer, (Keech) J Stillwagon (old).....	rig
Raymilton, (Raymond) W Raymond.....	drilling
" (Adams) Glenn & Co.....	drilling

Vicinity Pleasantville.

Landis, W P Black (old).....	rig
Talman, " No 7.....	drilling
" " No 8.....	drilling
" " No 9.....	rig
" " No 10.....	rig bldg
Dailey, " No 4.....	drilling
" " No 5.....	rig bldg
Sanney, ".....	rig bldg
Tarr, ".....	rig
Poor, Joy & Co No 3.....	rig
Atkinson, Culp & Stewart No 2.....	rig
" Wait Bros No 3.....	drilling
Walter Sedoras, Shamburg & Watson.....	drilling
Cherry Run O Co tract, Everett.....	drilling
Herbert, Dr Shamburg.....	rig

Tipperary, Hall's Run, Etc.

Humboldt, Taylor, Torrey & Murphy No 2.....	sand
M Fox, Wesley Chambers.....	sand
McAlmont, Porterfield & Treat.....	drilling
Phil & Bost, Porterfield, Kelley & Co.....	rig
Slab Furnace, Wood & Co No 3.....	rig
Phil & Bost, Gates & Doty No 2.....	rig bldg
Hendershot, Deitrich & Co.....	rig bldg
Plumer farm, Loots & Co.....	drilling

Mt. Hope and Smoky District.

Miller, Galbraith & Co No 4.....	drilling
Steeffe, Sheasley & Galbraith No 1.....	drilling

Vicinity Emlenton.

J M Black, J M Black & Son.....	drilling
Hayes, James Bennett.....	drilling
Allen, Harrington & Co.....	drilling
R S Grant, Edwards & Co.....	rig
R Anderson, Redick & Anderson.....	drilling
Murrensville, Bastaff & Saliday.....	drilling

Bullion.

Plumer, Hoffman & Co.....	drilling
Murvin, Burns & Co.....	drilling
Atwell, Hovis & Co.....	rig
Crawford, McFadden & Co.....	rig

New rigs.....	22
Old rigs and shut down.....	4
Drilling.....	24
Total.....	50

Clarion.

John Henel, Koeh Oil Co No 8 (old).....	rig
Lloyd, Dr Metzger (old).....	rig
Shreffler, McCannion & Co (old).....	rig
Wagner & Curl, J V Ritts (old).....	rig
Brown, J V Ritts (old).....	rig
Heasley, Heasley & Co (old).....	rig
Shippen, John J Carter No 10.....	300
Egypt, Hess & Eggers.....	900
Wagner, Hahn & Wagner.....	200
Cotterman, Kerstetter & Co.....	800
Ossil, Kribbs & Co.....	rig
Creswell, (Nineveh) Lee & Co.....	drilling
Kossuth, Hulings Bros.....	drilling
New rigs.....	1
Old rigs.....	6
Wells drilling.....	6
Total.....	13

Butler and Armstrong.

Chas Duffey, Hoch & Co (old).....	rig
Peiffer, Marshall Oil Co No 2.....	drilling
Goehring, Phillips & Osborne No 1.....	600
Geo Behm, " No 5.....	50
Stokey, " No 1.....	2000
McAlmont, " No 14.....	800
J Diekey, Fisher Oil Co.....	1500
Thorn Hill, Munhall & Co.....	drilling
Blakeley, Coast & Co No 2.....	1500
" Root & Johnson No 4.....	drilling
" " No 5.....	drilling
Walley, Walley & Jordan (old).....	rig
Saxonsburg, (Weleh) Kiskadden & Co.....	1650
Lonetz, Greenlee & Co (shut down).....	sand
Wissner, (Oakland twp) McGuire & Co.....	600
Zinkhorn, Gibson & Gahagan No 1.....	drilling
Frazier's Mills, Yeagle & Co.....	rig bldg
Miller Eddy, Joseph Thomas & Co.....	drilling
McElwe, Dennison & Fleegler.....	drilling
McCullough, Morrison & Albert.....	drilling
Williamson, Thomas & Co.....	drilling
Jennings, R Jennings.....	rig
Orton, J M Edwards.....	drilling

H McLaughlin, Wheeler & Co.....	sand
Joseph Knox, Devitt & Co.....	drilling
Duffey, Rock Oil Co No 7.....	1000
Wid McElwee, Burns, McMarlin & Taylor No 2.....	100
C Rogers, G Fetzner.....	drilling
Coyle, M P Black & Co No 3.....	drilling
Jacob Smith, James Redd, No 1.....	drilling
Sweeny, C Wolford & Co No 1.....	drilling
Adams, Stage & Co.....	drilling
Robinson, J Gorman.....	rig
Walley, Turner, Sutton & Co.....	drilling
D Bartley, W A Kelley.....	drilling

St. Joe.

Shultz, Shultz & Co.....	drilling
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Thorn Creek.

Harbison, Connors & Fishel (old).....	rig
McLaughlin, Thorn Oil Co.....	drilling
Mrs Harbison, Connors & Fishel.....	drilling
Bulford, C D Greenlee No 1.....	drilling
Lonetz, Weller & Co.....	drilling
Crawford, Haymaker, Leggett & Co.....	rig
New rigs.....	4
Old rigs and shut down.....	3
Drilling.....	34
Total.....	41

Washington.

I Wilson, Forest Oil Co (old).....	rig
Johnson, " (old).....	rig
Martin heirs, John McKeown No 8.....	2300
" " " No 9.....	2200
" " " No 10.....	sand
" " " No 11.....	rig
" " " No 12.....	rig
Coal Center, Hornbake (shut down).....	1500
Wiles, C O & Gas Co No 1.....	rig
McKeesport, Stone & Co.....	drilling
Wright, Chartiers Oil Co & F W Andrews (old).....	rig
Bane, Ten-Mile Oil Co.....	1000
Fergus, Chartiers Oil Co No 7.....	rig
Davis, Davis Bros No 1.....	2200
Miller, Marshall Oil Co.....	600
Bailey, McKennan Oil Co.....	drilling
Nicholls, Willets & Son.....	drilling
West Belle Vernon, (for gas).....	drilling
California, J M Guffey (old).....	rig
Muncie, I Willets.....	2200

Taylorstown.

Carrothers, West Virginia Natural Gas Co No 1.....	sand
Hutchison, W Va Nat Gas Co.....	rig
Dinsmore, " (for gas).....	drilling
Robert Noble, " No 1.....	1700
Buchanan, R H Thayer & Co.....	sand
Cundall, Anchor Oil Co No 2.....	2300
" " " No 3.....	1750
McLain, Iseman & Co No 1.....	1450
Work, Sharp & Co.....	1300
Miller, B B Campbell & J B Aiken.....	300
Bailey, McKennan Oil Co.....	drilling
Sproul, Vandergrift & Reed.....	drilling
Carson, McLane & Co.....	rig
Martin, Kuntz, Todd & Co.....	rig
New rigs.....	7
Old rigs.....	4
Drilling.....	21
Total.....	32

Shannopin.

Thos Pinkerton, J S McKelvy (old).....	rig
Charles Eachel, Raccoon Oil Co No 4 (old).....	rig
John Morrow, Raccoon Oil Co No 4 (old).....	rig
Andrews, Philadelphia Co.....	150
Gilfillan, ".....	rig
McAllister, Raccoon Oil Co No 3.....	600

Greene County, Etc.

Fordyce, E M Hukill & Co No 1 (shut down).....	1360
Girard, E M Hukill & Co No 1.....	1060
Girard, E M Hukill & Co No 2.....	drilling
Hathaway, E M Hukill & Co No 1 (fishing).....	1060
Mt. Morris, E M Hukill & Co No 1 (old).....	drilling
Longanecker, " (old).....	rig
Ninevah, Johnston & Hamilton.....	drilling
Bristoria, Forest Oil Co.....	1300
New rigs.....	1
Old rigs and shut down.....	4
Drilling.....	6
Total.....	11

FIELD OPERATIONS SUMMARIZED.

WELLS COMPLETED, WITH THE ESTIMATED PRODUCTION ON THE LAST DAY OF THE MONTH.

ALLEGANY FIELD.

Division of Field.	AUGUST, 1887.			JULY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Seio.....	0	0	0	0	0	0
Alma.....	0	0	0	0	0	0
Wirt.....	1	4	0	1	0	1
Bolivar.....	0	0	0	0	0	0
Clarksville.....	1	5	0	1	0	1
Genesee.....	1	5	0	0	0	0
Miscellaneous.....	0	0	0	0	0	0
Total.....	3	14	0	2	0	2

BRADFORD FIELD.

Division of Field.	AUGUST, 1887.			JULY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
E. and W. Branches.....	5	44	0	7	64	0
Kendall Creek.....	4	40	0	4	40	0
Foster Brook.....	0	0	0	1	6	0
Knapp's Creek.....	0	0	0	2	11	0
Four Mile.....	0	0	0	0	0	0
Indian & Meeks Creeks.....	1	8	0	3	22	0
Cole Creek.....	0	0	0	1	25	0
Kinzua.....	0	0	0	1	11	0
Miscellaneous.....	0	0	0	1	0	1
Total.....	10	92	0	21	179	1

WARREN AND FOREST.

District.	AUGUST, 1887.			JULY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Glade.....	10	275	5	10	78	5
Clarendon.....	5	25	0	10	51	0
Tiona.....	5	20	1	8	39	1
Cooper.....	0	0	0	1	10	0
Balltown.....	2	10	1	1	8	0
Kane.....	0	0	0	0	0	0
Grand Valley.....	17	80	3	13	97	0
Miscellaneous.....	6	30	2	5	50	1
Total.....	45	340	12	48	333	7

LOWER COUNTRY.

District.	AUGUST, 1887.			JULY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Venango.....	50	236	14	40	200	9
Clarion.....	8	41	4	7	40	1
Butler and Armstrong.....	19	934	5	36	966	14
Washington.....	15	5160	1	7	350	1
Shoustown, Etc.....	2	10	1	1	25	0
Total.....	94	6401	25	91	1581	25

GRAND SUMMARY.

District.	AUGUST, 1887.			JULY, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Allegany.....	3	14	0	2	0	2
Bradford.....	10	92	0	21	179	1
Warren and Forest.....	45	340	12	48	333	7
Lower Field.....	94	6401	25	91	1581	25
Total August.....	152	6847	37	162	2093	35
Total July.....	162	2093	35			
Difference.....	10	4754	2			

Rigs Up and Building—Wells Drilling.

ALLEGANY FIELD.

Division of Field.	AUGUST 31, 1887.				JULY 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Seio.....	0	4	1	5	0	5	0	5
Alma.....	0	5	0	5	0	5	0	5
Wirt.....	0	2	3	10	0	2	1	3
Bolivar.....	0	2	0	2	0	2	0	2
Genesee.....	0	8	1	9	0	8	2	10
Clarksville.....	0	6	1	7	0	6	1	7
Miscellaneous.....	0	0	0	0	0	0	0	0
Total.....	2	32	6	40	0	34	4	38

BRADFORD FIELD.

Division of Field.	AUGUST 31, 1887.				JULY 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
E. and W. Branches.....	0	7	0	7	1	7	3	11
Kendall Creek.....	2	0	2	4	3	0	3	6
Knapp's Creek.....	0	3	1	4	0	3	2	5
Foster Brook.....	0	4	3	7	2	3	2	7
Four Mile.....	0	3	1	4	0	3	1	4
Indian Creek.....	3	1	1	5	1	1	1	3
Cole Creek.....	0	4	1	5	0	5	0	5
Kinzua.....	1	1	1	3	1	1	1	3
Miscellaneous.....	0	0	1	1	0	0	1	1
Total.....	6	23	11	40	8	23	12	43

WARREN AND FOREST.

Division of Field.	AUGUST 31, 1887.				JULY 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Glade.....	3	0	2	5	2	0	7	9
Clarendon.....	3	4	3	10	4	5	5	14
Tiona.....	0	1	3	4	3	2	5	10
Cooper.....	0	2	0	2	0	2	0	2
Balltown.....	0	2	0	2	0	2	1	3
Kane.....	0	3	2	5	0	3	2	5
Grand Valley.....	2	11	3	16	8	11	5	24
Miscellaneous.....	5	2	11	18	1	1	12	14
Total.....	13	25	24	62	18	26	37	81

LOWER COUNTRY.

Division of Field.	AUGUST 31, 1887.				JULY 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Venango.....	22	4	24	50	22	8	23	53
Clarion.....	1	6	6	13	1	6	6	13
Butler & Armstrong.....	4	3	34	41	11	4	25	40
Washington.....	7	4	21	32	4	3	30	37
Shoustown, Etc.....	1	4	6	11	2	4	6	12
Total.....	35	21	91	147	40	25	90	155

GRAND SUMMARY.

Field.	AUGUST 31, 1887.				JULY 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Allegany.....	3	32	6	40	0	34	4	38
Bradford.....	6	23	11	40	8	23	12	43
Warren and Forest.....	13	25	24	62	18	26	37	81
Lower Country.....	35	21	91	147	40	25	90	155
Total.....	56	101	132	289	66	108	143	317
Total July 31.....	66	108	143	317				
Difference.....	10	7	11	28				

SUMMARY of the Statements of the National Transit Company for July and August:

	August.	July.
	Barrels.	Barrels.
Receipts from all sources.....	1,704,404.28	1,584,532.39
Deliveries.....	1,884,209.73	1,637,751.05
Gross stocks end of month.....	32,576,610.26	32,912,595.80
Sediment and surplus.....	4,086,058.47	4,237,448.98
Total liabilities end of month.....	28,490,551.79	28,675,146.82
Outstanding acceptances.....	21,030,036.33	20,911,036.33
Credit balances.....	7,460,515.16	7,764,110.49

The above "receipts from all sources" for August were made up as follows:

Runs from wells.....	1,255,897.36
Received from other lines.....	448,506.92

Total.....1,704,404.28

The above "total deliveries" for August were made up as follows:

Regular shipments.....	1,836,506.12
Delivered to other lines.....	47,703.61

Total.....1,884,209.73

The above "receipts from all sources" for July were made up as follows:

Runs from wells.....	1,253,143.14
Received from other lines.....	331,389.25
Received in iron tanks.....	

Total.....1,584,532.39

The above "total deliveries" for July were made up as follows:

Regular shipments.....	1,600,224.47
Delivered to other lines.....	37,526.58

Total.....1,637,751.05

THE largest well yet found in the Ohio field was shot August 29. It is located on the Folz farm, in the North Baltimore district, 12 miles north of Findlay. When connected with the tanks it filled four 250-barrel tanks in the first three hours. It has since been partially shut in and is now allowed to flow 600 barrels a day through a single lead line.

Stocks Abroad.

Reports of stocks in London, and the seven principal Continental ports, are summarized in the following statement:

STOCKS AFLOAT AND ASHORE.	August 20, 1887.	July 23, 1887.
Seven Continental Ports.....	1,274,447	1,275,721
London.....	218,474	192,831
Total Stocks afloat and ashore.....	1,492,921	1,468,552
Increase in stocks since July 23.....	24,369	.....

A detailed statistical table giving the stocks on hand, the stocks in vessels on the ocean, and the amount unloading from the vessels at the different ports, is appended, which shows at a glance the condition of affairs abroad and the increase or decrease as compared with the corresponding period of 1886. The shipments represent the amount of oil going to the interior of Europe from the seaports:

STOCKS IN FOREIGN PORTS AUGUST 20, 1887.

PORTS.	Stocks week ending August 20.		Stocks afloat week ending August 20.		Loading. Week ending August 20.		Grand total stocks afloat and loading.		Receipts From July 1.		Shipments from July 1.	
	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.
London.....	174,526	155,774	.....	39,700	29,000	23,000	203,526	218,474	51,216	126,748	51,805	67,494
Bremen.....	227,195	197,433	49,726	6,792	26,200	12,000	303,121	216,225	90,636	129,318	74,867	81,271
Hamburg.....	229,673	197,547	29,398	82,031	107,900	53,500	366,971	333,078	204,292	266,780	129,284	154,284
Antwerp.....	192,452	142,046	33,434	35,990	25,400	81,800	251,286	259,836	120,092	96,411	88,340	59,047
Rotterdam.....	118,325	100,395	6,514	64,773	63,000	8,000	187,839	173,168	106,251	132,488	69,895	82,158
Amsterdam.....	71,610	23,437	16,386	16,857	.....	10,000	87,996	50,294	34,938	18,627	30,806	26,420
Stettin.....	66,196	133,303	28,708	46,198	20,000	31,000	114,904	210,501	97,381	138,679	47,978	42,888
Danzig.....	13,393	20,431	5,555	5,914	6,000	5,000	24,948	31,345	7,685	5,175	6,229	4,996
Total.....	918,844	814,592	169,721	258,555	248,500	201,300	1,337,005	1,274,447	661,325	787,478	447,399	451,064
Total stocks Continental Ports.....	1,547,744	1,122,310	918,844	814,592	155,512	182,808	169,721	258,555	169,000	176,000	248,500	201,300
Total afloat, ".....	1,872,256	1,481,118	1,337,065	1,274,447	33,000	72,000	25,300	25,300	10,600	65,900	10,000	42,300
Total loading.....	1,920,856	1,619,018	1,347,065	1,342,047	11,833,081	858,977	285,579	193,523	56,200	85,400	96,600	73,100
Afloat and loading for direct Continental Ports.....	2,262,635	1,902,941	1,647,191	1,633,62	.....	.....	.....	.....	.....	.....	.....	.....
" " " Baltic Sea, exclusive Stettin and Danzig.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " " Total Continental Ports.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " " Total London.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
" " " English harbors, exclusive London.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Grand total.....	2,262,635	1,902,941	1,647,191	1,633,62	.....	.....	.....	.....	.....	.....	.....	.....

OFFICIAL STATEMENT—EXPORTS OF PETROLEUM, JULY, 1887.

BY WM. F. SWITZLER, CHIEF OF BUREAU OF STATISTICS, WASHINGTON, D. C., AUGUST 9, 1887.

CUSTOMS DISTRICTS.	MINER'L CRUDE		NAPHTHAS.		ILLUMINATING.		LUBRICATING & PARAFFINE OILS.		RESIDUUM.		TOTAL.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Boston and Charlestown, Mass.....	.....	.....	.....	.....	405,805	35,804	13,744	2,239	.....	.....	419,549	38,043
New York, N. Y.....	2,144,507	141,550	479,607	39,951	28,429,183	2,216,504	1,544,927	246,345	4,032	358	32,602,258	2,644,758
Philadelphia, Pa.....	1,910,626	114,299	1,082,078	80,838	11,833,081	858,977	10,382	1,316	212,142	9,508	15,048,309	1,064,938
Baltimore, Md.....	.....	.....	.....	.....	1,455,190	97,424	.....	.....	.....	.....	1,455,190	97,424
Total for July, 1887.....	4,055,133	255,769	1,561,685	120,789	42,123,259	3,208,709	1,569,055	249,950	216,174	9,946	49,525,306	3,845,163
Total for July, 1886.....	5,968,112	384,231	1,478,555	125,164	50,032,881	3,956,834	1,232,164	223,651	237,846	12,943	58,949,558	4,702,823
Total for 7 months ending July 31, 1887.....	35,984,667	2,297,451	6,437,536	540,021	260,703,798	20,100,536	10,786,900	1,891,859	2,599,422	122,127	316,512,373	24,951,994
Total for 7 months ending July 31, 1886.....	38,176,137	2,633,295	5,018,738	427,580	277,465,484	22,846,849	7,458,777	1,416,948	1,366,088	78,213	329,515,224	27,402,58

CRUDE QUOTATIONS FOR AUGUST, 1887.

Day of Month and week.	BRADFORD.				OIL CITY.				NEW YORK.				PITTSBURGH.			
	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed
M 1.....	58 1/4	59 1/2	57 3/4	57 3/4	58 3/8	59 3/8	57 1/4	57 3/8	57 3/8	59 1/2	57 1/4	57 3/4	57 3/4	59 3/8	57 3/4	57 3/4
T 2.....	57 3/4	58 3/4	56 3/4	57	58	58 3/4	57	57	58	58 3/8	57 3/8	57	57 3/4	58 3/8	57	57 3/4
W 3.....	56 3/4	57 3/4	56 3/4	57 1/2	57 3/4	57 3/4	56 3/4	57 3/4	56 3/4	57 3/8	57 3/8	57 3/8	57	57 3/4	56 3/4	57 3/4
T 4.....	57 1/2	58 3/4	57 3/4	57 1/4	57 3/4	58	57 1/4	57 1/2	57 3/4	58	57 3/8	57 3/8	57 1/2	58 3/8	57 1/4	57 3/4
F 5.....	57 1/4	57 1/2	57 3/4	57 3/4	57 1/4	57 3/4	57 1/4	57 1/2	57 1/4	57 3/8	57 3/8	57 3/8	57 1/4	57 3/4	57 1/4	57 3/4
S 6.....	57 1/2	57 3/4	57 3/4	57 3/4	57 3/4	57 3/4	57 1/2	57 1/2	57 1/2	57 3/8	57 3/8	57 3/8	57 1/2	57 3/4	57 1/4	5 1/2
M 8.....	57 1/2	57 3/4	57 1/4	57 1/4	57 1/2	57 1/2	57 1/4	57 3/8	57 1/2	57 3/4	57 1/4	57 1/4	57 1/2	57 3/8	57 1/4	57 1/4
T 9.....	57 1/4	59 1/4	57 1/4	58 3/8	57 3/8	59 1/4	57 3/8	58 3/8	57 3/8	59 1/8	57 3/8	58 3/8	57 3/8	59 3/8	57 1/4	58 3/8
W 10.....	59 3/8	59 3/8	58 3/4	59	59	60	58 3/8	59	59 1/4	59 3/8	58 3/8	59	58 3/8	60	58 3/8	59
T 11.....	59	59 3/4	58 3/4	59 1/2	59	59 3/8	58 3/8	59 1/2	59	59 1/2	58 3/8	59 3/8	59 1/2	59 1/2	58 3/8	59 3/8
F 12.....	59 3/8	60 3/4	59 3/8	60 3/4	59 3/8	60 3/4	59 3/8	60 3/4	59 3/8	60 3/4	59 3/8	60 3/4	59 3/8	61 1/8	59 3/8	61
S 13.....	60 3/4	62 1/2	60 3/4	61 1/4	61	62 1/4	61	61 1/2	61	62 3/8	60 3/4	62	61 1/4	62 3/8	61	61 1/2
M 15.....	61 1/2	61 3/8	60 3/4	60 5/8	61 1/2	61 3/8	60 3/4	60 5/8	61 3/8	61 3/4	60	60 5/8	61 1/2	61 3/8	60 3/4	60 5/8
T 16.....	60 3/4	62 1/2	60 1/2	61 3/8	60 3/4	62 1/2	60 3/4	61 3/8	60 3/4	62 1/2	60 1/2	61	60 3/4	62 1/2	60 1/2	61 3/8
W 17.....	61 1/4	61 3/8	61 1/4	61 3/8	61 1/4	61 3/8	61 1/4	61 3/8	61 1/4	61 3/8	61 1/4	61 3/8	60 3/4	61 3/8	60 3/4	61 3/8
T 18.....	60 3/4	61 3/8	60 3/4	61 1/4	61 1/4	61 3/8	61	61 1/4	61	61 3/8	60 3/4	61 1/4	60 3/4	61 3/8	60 3/4	61 3/8
F 19.....	60 3/4	60 3/8	58 3/8	58 3/8	60 3/4	60 3/8	58 3/8	59	60 3/4	60 3/8	58 3/8	59	60 3/4	60 3/8	58 3/8	59 3/8
S 20.....	59 1/8	59 3/8	59 3/8	59 1/2	59 1/4	59 3/8	59 1/4	59 1/2	59 3/8	59 1/2	59	59 1/4	59	59 1/2	59	59 3/8
M 22.....	59 1/2	61 1/4	59 1/4	61 3/8	59 1/2	61 1/2	59 1/4	61 3/8	59 3/8	61 1/4	59 1/4	61	59 1/4	61 1/4	59 1/4	61 3/8
T 23.....	61 3/8	62 1/2	61 3/8	61 3/8	61 3/8	62 1/2	61 3/8	61 3/8	61 1/4	62 1/2	61 1/4	61 3/8	61 1/4	62 1/2	61 1/4	61 3/8
W 24.....	61 3/4	62	60 3/4	61	61 3/8	62	61	61	61 3/4	62	61	61	61 3/8	62	61	61 3/8
T 25.....	61	62 1/4	60 3/4	61 3/8	61 1/4	62 1/8	60 3/4	61 3/8	61 3/8	62 1/8	60 3/4	61 3/8	61 1/4	62 1/8	60 3/4	61 3/8
F 26.....	61 3/4	62 3/8	61 1/2	62 3/4	61 3/4	62 3/8	61 3/4	62 3/4	61 3/8	62 3/8	61 3/8	62 3/4	61 3/4	62 3/8	61 3/8	62 3/4
S 27.....	61 3/4	62 3/8	61 1/2	62 3/4	61 3/4	62 3/8	61 3/4	62 3/4	62	62 3/8	61 3/8	62 3/4	61 3/4	62 3/8	61 3/8	62 3/4
M 29.....	62 1/4	62 3/8	61 3/8	62	62 3/8	62 1/2	61 3/8	62	62 1/4	62 3/8	61 3/4	62	62 3/8	62 3/8	61 3/4	61 3/4
T 30.....	62	62 3/8	61 3/8	62	62	62 3/8	61 3/8	62	62	62 3/8	61 3/8	62	61 3/4	62 1/4	61 3/4	61 3/4
W 31.....	62	65	61 3/8	64 1/2	62 1/4	65	62	64 1/2	62	65	61 3/8	64 1/2	61 3/4	64 3/4	61 3/4	64 3/4

Runs, Shipments and Stocks.

RUNS OR RECEIPTS.

PIPE LINE.	AUGUST, 1887.	JULY, 1887.
National Transit Co.	1,255,897.36	1,253,143.14
Tidewater	168,007.25	167,757.97
Octave Oil Co.	3,153.00	1,843.00
Keystone Pipe Line	20,374.10	23,139.30
Pittsburgh Pipe Line	92,495.57	100,639.34
Southwest Pennsylvania	303,507.05	306,328.69
Total	1,843,434.33	1,852,851.44
Daily average	59,465.62	59,769.40

In the above runs only the oil received by the National Transit Co. directly from the wells, is included.

DELIVERIES OR SHIPMENTS.

PIPE LINE.	AUGUST, 1887.	JULY, 1887.
National Transit Co.	1,836,506.12	1,600,224.47
Tidewater	204,275.15	225,275.86
Octave Oil Co.	2,735.00	1,195.00
Keystone Pipe Line	28,506.52	22,639.38
Pittsburgh Pipe Line	94,263.21	102,964.58
Southwest Pennsylvania	403,842.71	274,534.34
Total	2,570,128.71	2,226,833.63
Less oil transferred between lines	448,506.92	331,359.25
Total	2,121,621.79	1,895,444.38
Daily average shipments	68,439.41	61,143.37

In the above shipments only the oil delivered to refiners is included.

Daily excess of shipments over runs, August	8,973.79
Daily excess of shipments over runs, July	1,373.97
Daily excess of shipments over runs, June	4,915.93
Daily excess of shipments over runs, May	5,072.36
Daily excess of shipments over runs, April	4,083.45
Daily excess of shipments over runs, March	7,983.78
Daily excess of shipments over runs, February	3,564.10
Daily excess of shipments over runs, January, 1887	8,702.88
Daily excess of shipments over runs, December	11,270.81
Daily excess of shipments over runs, November	10,818.54
Daily excess of shipments over runs, October	580.75
Daily excess of runs over shipments, September	8,057.13
Daily excess of runs over shipments, August	11,931.56
Daily excess of runs over shipments, July	5,557.20
Daily excess of runs over shipments, June	4,793.41
Daily excess of runs over shipments, May	3,967.03
Daily excess of shipments over runs, April	4,899.21
Daily excess of shipments over runs, March	4,561.81
Daily excess of runs over shipments, February	14,701.52
Daily excess of shipments over runs, January, 1886	7,825.68

NET STOCKS.

PIPE LINE.	AUGUST 31, 1887.	JULY 31, 1887.
National Transit Co.	28,490,551.79	28,675,146.82
Tidewater	1,545,709.89	1,536,760.74
Octave Oil Co.	3,590.00	4,986.00
Keystone Pipe Line	29,138.88	37,271.30
Pittsburgh Pipe Line	133,979.58	134,761.91
Southwest Pennsylvania	1,055,108.50	1,154,026.43
Total	31,258,078.64	31,542,952.80
Stocks decreased August	284,874.16	
Stocks decreased July	47,794.24	
Stocks decreased June	174,012.20	
Stocks decreased May	286,403.15	
Stocks increased April	112,893.77	
Stocks decreased March	237,699.31	
Stocks decreased February	105,988.75	
Stocks decreased January, 1887	777,975.85	
Stocks decreased December	357,196.56	
Stocks decreased November	286,526.86	
Stocks decreased October	1,790.72	
Stocks increased September	214,078.99	
Stocks increased August	362,652.56	
Stocks increased July	188,510.62	
Stocks increased June	216,583.97	
Stocks increased May	110,800.44	
Stocks decreased April 1886	165,635.61	

RECEIPTS. DELIVERIES.

Daily average August	59,466	68,439
Daily average July	59,769	61,143
Daily average June	63,413	68,329
Daily average May	64,522	69,594
Daily average April	65,072	60,988
Daily average March	63,915	71,899
Daily average February	63,374	66,938
Daily average January, 1887	62,629	71,332
Daily average December	67,857	79,127
Daily average November	70,767	81,586
Daily average October	76,019	76,600
Daily average September	77,989	69,932
Daily average August	76,880	64,949
Daily average July	74,880	69,323
Daily average June	75,811	71,017
Daily average May	68,602	64,635
Daily average April 1886	64,228	69,127

NOTE—The above figures are in barrels of 42 gallons each, and include only the pipe lines of the New York and Pennsylvania oil regions. In addition to the above receipts from 1200 to 1600 barrels of oil a day are shipped by rail out of the region by large producing firms which have no chartered pipe line.

SHENANGO & ALLEGHENY R. R.

TAKES EFFECT MONDAY, JULY 11, 1887.

Trains are run by Standard Central Time (90th Meridian.)

NORTHWARD.			STATIONS.			SOUTHWARD.		
6	4	2				1	3	5
P. M.	A. M.	A. M.				A. M.	A. M.	P. M.
6 35	11 55	8 20	Ar.	Greenville	Dp.	6 50	11 10	3 50
6 25	11 45	8 10		Shenango		7 00	11 20	4 00
6 13	11 32	7 58		Kremis		7 11	11 32	4 11
6 04	11 23	7 50		Fredonia		7 20	11 42	4 20
5 58	11 18	7 45		Coolspring		7 24	11 46	4 25
5 47	11 06	7 44		Kerby Siding		7 25	11 47	4 26
5 47	11 05	7 35		Mercer		7 35	11 57	4 37
5 37	10 55	7 25		Pardee		7 45	12 07	4 46
5 33	10 51	7 20		Filer		7 49	12 11	4 50
5 26	10 44	7 12		Grove City		7 58	12 18	4 58
5 23	10 41	7 09		Reed		8 00	12 20	5 00
5 13	10 30	6 59		Harrisville		8 11	12 31	5 13
5 08	10 26	6 54		Wick		8 15	12 35	5 17
5 03	10 21	6 49		Branchton		8 20	12 40	5 22
5 00	10 18	6 45		Coaltown Junction		8 21	12 41	5 23
4 57	10 16	6 42		Keisters		8 24	12 44	5 26
4 53	10 12	6 39		Slippery Rock Park		8 29	12 47	5 29
4 50	10 09	6 36		Hallston		8 32	12 50	5 32
4 42	10 01	6 28		Euclid		8 42	1 00	5 42
4 33	9 52	6 18		Jamisonville		8 51	1 10	5 52
4 25	9 45	6 10		Onida		8 59	1 18	6 00
4 15	9 35	6 00		P. & W. Junction		9 10	1 30	6 10
4 05	9 30	5 55	Dp.	Butler	Ar	9 13	1 35	6 15
12 40	7 20			Pittsburgh & Western R. R.				
				Allegheny		11 20	4 00	8 00
P. M.	A. M.	A. M.				A. M.	P. M.	P. M.

HILLIARD BRANCH.

34	32	STATIONS.			33	35
A. M.	A. M.				A. M.	P. M.
12 00	6 40	Ar.	Branchton	Dp.	8 45	5 30
11 50	6 35		Bovard		8 55	5 35
11 30	6 15		Annandale		9 15	6 00
11 20	6 07		Roy		9 25	6 10
11 00	6 00	Dp.	Hilliard	Ar	9 35	6 20
A. M.	A. M.				A. M.	P. M.

Trains 4 and 5 run daily with through coach service between Allegheny, Chautauqua Lake and Jamestown, N. Y. All other trains daily except Sunday.

I. D. STINSON, G. P. A.,
Greenville, Pa.

J. T. BLAIR, Gen. Man.,
Greenville, Pa.

Pat. July 6, '86.

MILLER AUTOMATIC PACKER

Pat. July 27, '87.



PACK GUARANTEED.

FOR OIL AND GAS WELLS.

EASILY DRAWN OUT

Supports the Casing and Packs at any Point in the Well.

JUST THE PACKER FOR WELLS HAVING LEAKY CASING. Packers for 6 in. and 5½ in. wells have 4¼ in. inside diameter to drill or pump through. Reduced to any size tubing for flowing wells or gas wells.

Also packers for 7½ in. and 8 in. wells have 5½ in. or 6 in. inside diameter. Write for Circular.

Telephone 523.

MILLER & McCONNELL, 144 Fifth Av., Pittsburgh, Pa.

THE PETROLEUM AGE.

ACME OIL COMPANY,

→ **REFINERS OF PETROLEUM** ←

MANUFACTURERS OF THE

CROWN ACME OIL

Prepared with Great Care for Family Use.

ABSOLUTELY SAFE,

AND THE

Best Illuminator in the World.

WORKS AT OLEAN, N. Y., & TITUSVILLE, PA.

MAIN OFFICE, 26 BROADWAY, N. Y.

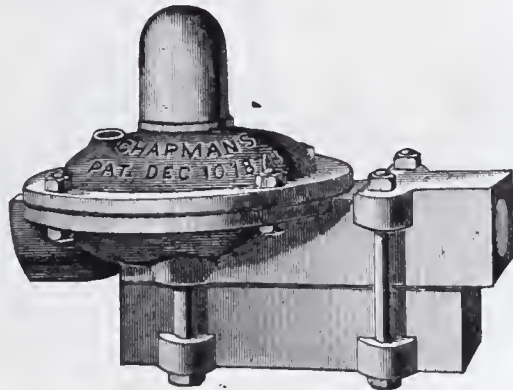
THE PETROLEUM AGE.

J. L. CHAPMAN & CO.,

P. O. Box 530, PHILADELPHIA, PA.

Natural Gas

Regulators.



Automatic

Stop-Offs.

These Regulators will reduce the high pressure in mains to that desired for use, will not pulsate and are perfectly safe to be placed in buildings, as there is no escape of gas.

These Stop-Offs automatically shut, when the supply of gas in the main has been stopped from any cause. [SEND FOR CIRCULARS.]

1860.

1886.

THE TIFFT ENGINES AND BOILERS.

Honest, Reliable and Economical. Over 7,000 in use.

Superior in finish and completeness to all others. Prices as low as any standard machinery.

Address,

Geo. W. Tiff, Sons & Co.,
BUFFALO, N. Y.

Or **A. McLEAN**, General Manager, Branch Office, Bradford, Pa.

AMERICAN STEAM LAUNDRY

GODFREY & HUNT., Proprietors.

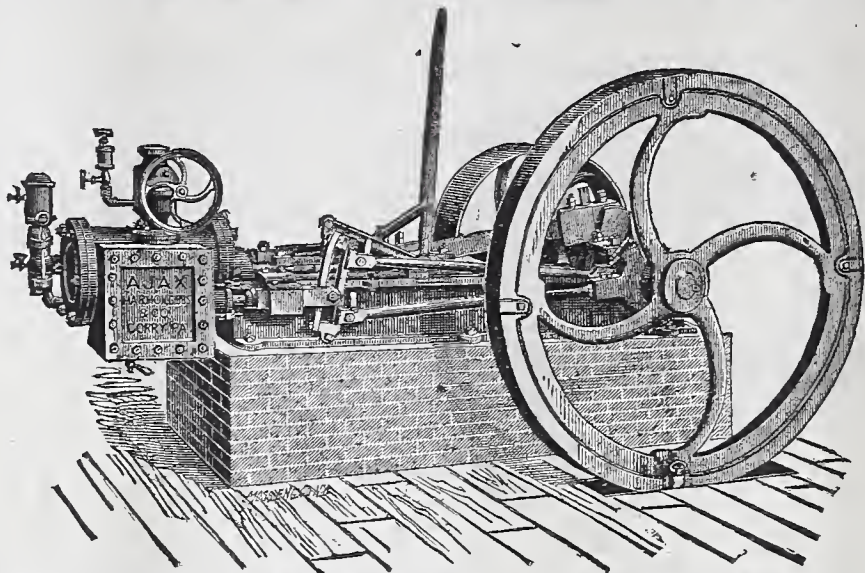
WORKS NOS. 9 TO 17 BISHOP STREET.

OFFICE 55 MAIN ST., - - - BRADFORD, PA.

TELEPHONE.

DELIVERY WAGONS.

THE AJAX ENGINE,



Manufactured by Harmon, Gibbs & Co.,

Is still the favorite in every field from the 400 feet wells of Grand Valley to the 3,000 feet wells of Washington. Economy in Fuel, Strength, Power, Speed and Durability are its strong points. Nearly 2,000 now in use, and you may travel from Wellsville, N. Y., to Macksburg, O., and not find one in a junk or repair shop.

We finish them in the shop and do not have to follow them into the field to make them run. Record of "Ajax" No. 1105 over 22,000 feet and still drilling.

JAMES M. LAMBING, General Agent, Corry, Pa.

OFFICE OPPOSITE PASSENGER DEPOT.

VICK'S FLORAL GUIDE.

If you are in want of Garden, send 10 cts. or anything for the seeds, which can be deducted from the first order.
JAMES VICK, SEEDS SEEDSMAN, ROCHESTER, N. Y.

Buffalo, Rochester & Pittsburgh R. R.

BUFFALO AND ROCHESTER DIVISION.

May 22, 1887.

Eastern Time.									
STATIONS.									
P. M.	A. M.	P. M.	A. M.	Ar.	Lv	A. M.	P. M.	A. M.	P. M.
7 15	6 20	11 00		Ar. Buffalo..	Lv	8 10	5 10		
3 16				" Rochester "				7 50	
2 30	3 30	8 00		" Salamanca "				11 44	
6 00				Lv. Bradford. Ar		11 00	8 00	12 30	
	P. M.						P. M.	P. M.	
	2 15			Ar do	Lv		12 55		
	11 38			" Ridgway "			3 28		
	10 14			" Falls Creek "			4 51		
	10 08			" Dubois "			4 58		
	9 00			Punxsntawney.			5 59		
	A. M.			Lv	Ar				

Thousand Mile Tickets sold at Two Cents per mile.

Connections made at Salamanca with the N. Y., P. & O. R. R. for all points West and Southwest; also with the Erie R. R. for all Eastern points; at Bradford with the Narrow Gauge system to all points in the Oil Regions.

JAS. T. GARDNER, Snp't. I. S. EMERY, Gen. Pass. Agt.

Warren and Farnsworth Valley Railroad.

Narrow Gauge Railroad to Garfield, Vandergrift and Dunham's Mills.
Clarendon, Lv.... 8 00 5 40 Garfield, Lv.... 9 00 6 30
Garfield, Ar.... 8 52 6 25 Clarendon, Ar.... 9 52 7 22

Trains are run on P. & E. R. R. time. Freight delivered at Vandergrift, one and one-quarter miles south of Garfield, and at Dunham's Mill, five miles west of Garfield.

A. D. WOOD, General Manager.

PETROLEUM REAL ESTATE CO

C. D. ANGELL,

OFFICE: 59 MAIN ST., BRADFORD, PA.

Buy, sell and lease all kinds of Oil Lands and City Property, Negotiate Contracts and do a General Commission Business. Information carefully given. Address Lock Box 1275.

BRADFORD, BORDELL & KINZUA

AND

Bradford, Eldred & Cuba Railroad.

May 23, 1887.

WEST.				STATIONS.				EAST.			
Exp.	Mail.			Ar.	Lv	Exp.	Mail.				
P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.
5 20	11 50			Ar. Bradford	Lv	7 25	2 25				
4 45	11 15			" Kinzua Junction		8 05	3 05				
4 38	11 10			" McCalmont		8 10	3 10				
4 36	11 08			" Rew City		8 13	3 12				
4 13	10 48			" Rixford		8 31	3 28				
4 08	10 43			" Duke Centre		8 36	3 33				
3 50	10 25			" Eldred		8 55	3 50				
3 32	10 10			" Bullis Mills		9 10	4 05				
3 17	9 54			" Ceres		9 26	4 21				
3 04	9 40			" Little Genesee		9 40	4 35				
2 55	9 30			" Bolivar		9 50	4 45				
2 34	9 06			" Allentown		10 14	5 09				
2 05	8 35	Lv		" Wellsville	Ar	10 15	5 40				
P. M.	A. M.	P. M.	A. M.	Ar.	Lv	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.
7 30	10 45			Ar. Bradford	Lv	8 30	5 15				
6 55	10 10			" Kinzua Junction		9 10	5 55				
6 47	10 02			" Aiken		9 17	6 02				
6 41	9 56			" Davis		9 23	6 08				
6 35	9 50			" Simpson		9 30	6 15				
6 25	9 40			" Ormsby		9 40	6 25				
5 50	9 05			" Smethport		10 15	7 00				
5 50	9 05			" Mt. Jewett		10 15	7 00				
5 15	8 30	Lv		" Kane	Ar	10 50	7 35				

Sunday Train leaves Smethport at 8:25 a. m., arriving at Bradford at 10 a. m. Returning leaves Bradford at 3:30 p. m. arriving at Smethport at 5:10 p. m.

JOHN C. McKENNA, Superintendent.

W. H. DUFUR, Chairman.

JAS. B. BERRY, Secretary and Treasurer.

THE ASTRAL REFINING CO.,
LIMITED.

Refiners and Producers of Petroleum,

ALL QUALITIES OF

Illuminating, Lubricating Oils, Naphthas and Gasoline,
OIL CITY, PENN'A.

Manufacturers of "Water White Astral Oil," 48 to 49 Gravity, 50 Fire Test.

J. W. McFARLAND,

BROKER IN OIL PRODUCTION.

81 MAIN STREET.

Buys, Sells and Leases all kinds of Oil Properties. In-
formation carefully given.

ADDRESS LOCK BOX 1925, BRADFORD, PA.

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Solicitor of Patents and Attorney in Patent Causes.

ROOM NO. 3,

Over Oil Well Supply Company, Limited.

Corner Main and Webster streets, - - BRADFORD PA.

FOR OIL OR GAS WELL PACKERS

SEND YOUR ORDERS TO

S. R. DRESSER, BRADFORD, PA.,

Who will fill them promptly with

The Best Malleable Iron Frame and Superior Quality of Rubber.

He Makes a Specialty of the Packer Business and Can Give You

Anything in that Line.

Philadelphia & Erie Railroad.

Time Table in Effect Nov. 15, 1886. | Eastern Standard Time.

EASTWARD.		Kane Express No. 18.	Day Expre-s No. 8.	Erie Mail No. 4	Kane Accom. No. 12.
Erie	Lv.	7 35 a m		2 45 p m	5 25 p m
Corry	"	9 00 "		4 13 "	6 55 "
Irvineton	"	9 50 "		5 00 "	7 50 "
Warren	"	10 05 "		5 15 "	8 05 "
Kane	Ar.	11 25 "		6 30 "	9 15 "
Kane	Lv.		6 25 a m	6 55 "	
Johnsonburg	"		6 58 "	7 30 "	
Emporium Junction	"		8 30 "	9 15 "	
Lock Haven	"		11 15 "	11 58 "	
Williamsport	"		12 20 p m	1 25 a m	
Harrisburg	Ar.		3 13 "	4 30 "	
Philadelphia	"		6 50 "	8 25 "	
WESTWARD.		Erie Accom. No. 11.	Erie Mail No. 3.	Niagara Express No. 11.	Erie Express No. 17.
Philadelphia	Lv.		11 25 p m	7 40 a m	
Harrisburg	"		3 30 a m	11 25 "	
Williamsport	"		7 10 "	2 25 p m	
Lock Haven	"		7 58 "	3 15 "	
Emporium Junction	"		10 30 "	6 25 "	
Johnsonburg	"		12 00 m	8 02 "	
Kane	Ar.		12 40 p m	8 35 "	
Kane	Lv.	6 35 a m	1 00 "		4 10 p m
Warren	"	7 45 "	1 58 "		5 25 "
Irvineton	"	7 58 "	2 09 "		5 45 "
Corry	"	8 55 "	2 56 "		6 45 "
Erie	Ar.	10 10 "	4 00 "		8 05 "

Trains daily except Sunday.

THROUGH-CAR ARRANGEMENT WESTWARD—Erie Mail—Pullman Palace Sleeping Cars Philadelphia to Erie, and Philadelphia to Williamsport (cars open to receive passengers at Philadelphia at 10 00 p m), and Washington to Williamsport. Passenger Coaches from Philadelphia to Erie, and Baltimore to Williamsport.

Niagara Express—Pullman Parlor Car Philadelphia to Williamsport.

THROUGH-CAR ARRANGEMENT EASTWARD—Day Express—Pullman Parlor Car Williamsport to Philadelphia. Passenger Coaches Kane to Philadelphia, and from Williamsport to Baltimore.

Erie Mail—Pullman Sleeper Erie to Philadelphia, and Williamsport to Philadelphia. (Car open to receive passengers at Williamsport at 9 00 p m.) Passenger Coaches Erie to Philadelphia, and Williamsport to Baltimore. Sleeping Car Williamsport to Washington.

DUNKIRK, ALLEGHENY VALLEY & PITTSBURGH R.R.

Going North.	Express. No. 2.	Mail. No. 4.	Sunday. No. 6.
Titusville, leave	7 35 a.m.	3 20 p.m.	7 35 a.m.
Grand Valley	8 03 a.m.	3 48 p.m.	8 01 a.m.
Irvineton	8 45 a.m.	4 36 p.m.	8 44 a.m.
Warren	8 58 a.m.	4 53 p.m.	8 56 a.m.
Junction	9 55 a.m.	5 45 p.m.	9 48 a.m.
Lily Dale	10 50 a.m.	6 36 p.m.	10 37 a.m.
Dunkirk, arrive	11 25 a.m.	7 10 p.m.	11 12 a.m.
Going South.	Mail. No. 1.	Express. No. 3.	Sunday No. 5.
Dunkirk, leave	9 25 a.m.	4 00 p.m.	2 40 p.m.
Lily Dale	10 03 a.m.	4 38 p.m.	3 14 p.m.
Junction	11 02 a.m.	5 45 p.m.	4 08 p.m.
Warren	11 55 a.m.	6 44 p.m.	5 06 p.m.
Irvineton	12 10 a.m.	7 00 p.m.	5 22 p.m.
Grand Valley	12 58 p.m.	7 49 p.m.	6 12 p.m.
Titusville, Ar	1 20 p.m.	8 15 p.m.	6 40 p.m.

THE PETROLEUM AGE.

WHEELING AND LAKE ERIE And Cleveland and Marietta R. R's.

Time Table—In effect July 18, 1887. Central Standard Time

EASTWARD.		No. 5.	No. 7.	No. 9*	No. 1*
Toledo.....Lv	7 45a. m.	1 00p. m.	4 50p. m.		
Oak Harbor.....Ar	8 41	1 53	5 45		
Fremont.....	9 07	2 18	6 08		
Clyde.....	9 24	2 34	6 23		
Bellevue.....	9 40	2 48	6 37		
Monroeville.....Lv	9 58	3 05	7 01	3 10a. m.	
Norwalk.....	10 15	3 22	7 17	3 22	
Wellington.....	11 05	4 13	8 08	4 03	
Creston.....Ar	11 53	5 05	8 55p. m.	4 47	
Orrville.....Ar	12 20p. m.	5 35	5 15a. m.	5 15*	
Orrville.....Lv	12 40	5 40	7 00	7 00	
Massillon.....Ar	1 20	6 20	7 42	7 42	
Massillon.....Lv	1 20	6 20	7 42	7 42	
Navarre.....	1 35	6 35	8 00	8 00	
Valley Junction.....Lv	2 15	7 20	8 45	8 45	
New Cumberland.....	2 23	7 33	9 05	9 05	
Sherrodsville.....	2 40	7 45	9 25	9 25	
Leesville.....	2 48	7 53	9 40	9 40	
Bowerston.....Ar	2 55p. m.	8 00p. m.	9 50a. m.	9 50a. m.	

WESTWARD.		No. 6.	No. 8.	No. 4.	No. 2*
Marietta.....Lv	6 50a. m.	12 15p. m.			
Macksburg.....	8 04	1 26			
Cambridge.....	9 40	3 00			
Newcomerstown.....	10 50	4 00			
Canal Dover.....	11 32a. m.	4 40p. m.			

Bowerston.....	11 25a. m.	3 45p. m.	6 35a. m.		
Leesville.....	11 32	3 55	6 43		
Sherrodsville.....	11 40	4 10	6 53		
New Cumberland.....	11 52	4 25	7 07		
Valley Junction.....	12 20p. m.	5 02	7 25		
Navarre.....	12 50	5 35	8 00		
Massillon.....	1 05	5 50	8 15		
Orrville.....Ar	1 40	6 25	8 53		
Orrville.....Lv	1 45	6 35*	8 58	*	
Creston.....Lv	2 18	7 02	9 28	5 30a. m.	
Wellington.....	3 05	7 43	10 15	6 20	
Norwalk.....	3 55	8 25	11 25	7 25	
Monroeville.....	4 07	8 35	11 37	7 35	
Bellevue.....	4 23	9 15	11 55	7 51	
Clyde.....	4 39	9 29	12 10p. m.	8 06	
Fremont.....	4 55	9 45	12 28	8 23	
Oak Harbor.....	5 20		12 53	8 45	
Toledo.....Ar	6 15p. m.	10 45*	1 50p. m.	9 40a. m.	

HURON DIVISION.

NORTHWARD.		No. 23.	No. 25.	No. 27.
Monroeville.....Lv			8 15a. m.	2 40p. m.
Norwalk.....Ar			8 35	3 25
Norwalk.....Lv		6 25a. m.	8 35	4 00
Milan.....		6 45a. m.	9 00	4 20p. m.
Fries Landing.....			9 12	
Huron.....Ar			9 30a. m.	

SOUTHWARD.		No. 24.	No. 26.	No. 28.
Huron.....Lv			1 15p. m.	
Fries Landing.....			1 30	
Milan.....		6 55a. m.	1 45	5 00p. m.
Norwalk.....Ar		7 15	2 10	5 22p. m.
Norwalk.....Lv		7 30	2 10	
Monroeville.....Ar		8 10a. m.	2 30	

* Daily.

This road is now open through from Toledo to Bowerston, connecting with the Pennsylvania System for all points East.

THROUGH CAR SERVICE—Between Toledo, Cambridge and Marietta; Toledo and Bowerston; Toledo and Akron, Youngstown and Pittsburgh; Chicago, Akron, Youngstown and Pittsburgh.

M. D. WOODFORD,

General Manager.

JAMES M. HALL,

Gen'l. Pass. Agent

W. & W. R. R. TIME TABLE. DECEMBER 27, 1886.

NORTHWARD		STATIONS.	SOUTHWARD	
No. 3	No. 1		No. 2	No. 4
P. M.	A. M.		A. M.	P. M.
2 00	6 00	Lv.....Waynesburg.....Ar	10 35	6 25
2 15	6 15	.....Sycamore.....	10 17	6 07
2 23	6 23	.....Swart.....	10 09	5 59
2 30	6 30	.....Deer Lick.....	10 02	5 52
2 38	6 38	.....West Union.....	9 53	5 43
2 47	6 47	.....Dunn.....	9 43	5 33
2 50	6 50	.....Lindley's Mills.....	9 40	5 30
3 01	7 02	.....West Amity.....	9 28	5 18
3 06	7 08	.....Luellen.....	9 22	5 12
3 11	7 13	.....Baker.....	9 17	5 07
3 14	7 20	.....McCracken.....	9 13	5 00
3 27	7 35	.....Vankirk.....	9 00	4 47
3 40	7 50	.....Braddock.....Lv	8 48	4 33
3 55	8 05	.....Washington.....Lv	8 35	4 20
6 36	9 55	.....Pittsburg.....Lv	6 10	1 55

P. C. & St. L. R R

Time given above is Central Standard, which is 40 minutes slower than Pittsburg or local time, or one hour slower than Eastern time.

The Company reserve the right to vary from this schedule as circumstances may require. All trains daily except Sunday.

C. E. BOWER, Superintendent.

The PITTSBURG & WESTERN RAILROAD Time Table

NORTHERN DIVISION.

STATIONS.		27		17	
		P. M.	A. M.	A. M.	
Bradford.....Lv				6 00	
Mt. Jewett.....Lv				7 40	
Kane.....				10 10	
Sheffield Junction.....				11 04	19
Marienville.....				11 47	P. M.
Tylersburg.....				12 27	
Clarion Junction.....		6 20	1 14	4 00	
Clarion.....		6 50	12 35	3 30	
Shippenville.....	23	6 30	1 28	4 14	
Knox.....		6 45	1 45	4 33	
St. Petersburg.....	A. M.	7 24	2 30	5 20	
Foxburg.....	5 40	7 38	3 00	5 40	
Parker.....	5 50	7 48	3 10		
Bruin.....	6 08	8 06	3 31	P. M.	
Perolia.....	6 18	8 17	3 45		
Karns.....	6 22	7	8 22	3 50	9
Millerstown.....	6 36		8 36	4 07	
St. Joe.....	6 50	A. M.	8 50	4 25	P. M.
Butler.....	7 18	5 15	9 30	5 25	1 55
Renfrew.....	7 39	5 28	9 46	5 45	2 11
Callery Junction.....	8 05	5 50	10 10	6 05	2 35
Allegheny.....Ar	9 30	7 10	11 20	7 20	3 58

NORTHBOUND TRAINS

STATIONS.		28	8	18	24	26
		A. M.	A. M.	A. M.	P. M.	P. M.
Allegheny.....Lv		3 15	9 20	7 20	12 40	5 35
Callery Junction.....		4 40	10 40	8 35	1 50	6 50
Renfrew.....		5 02	11 00	8 55	2 13	7 12
Butler.....		5 20	11 20	9 18	2 36	7 30
St. Joe.....				9 45	3 08	8 00
Millerstown.....				10 00	3 23	8 14
Karns.....				10 15	3 38	8 28
Perolia.....				10 20	3 45	8 32
Bruin.....				10 32	3 56	8 43
Parker.....				10 52	4 15	9 00
Foxburg.....		6 25	11 25	4 40	9 10	
St. Petersburg.....		6 44	11 41	4 54		
Knox.....		7 49	12 32	5 40		
Shippenville.....		8 11	12 53	5 58		
Clarion Junction.....		8 30	1 14	6 10		
Clarion.....		9 00	1 45	6 40		
Tylersburg.....			1 48			
Marienville.....			2 26			
Sheffield Junction.....			3 06			
Kane.....Ar			3 58			
Bradford.....Ar			4 40			

Westbound trains leave Callery Junction as follows:

Cleveland and Toledo Express 8.35 a. m., New Castle Accommodation 4.43 p. m., Chicago Express, with through Sleeping Car, 1.44p. m., Zelenople Accommodation 6.55 p. m.

No. 17 makes direct connection at Allegheny with B. & O. R. for Washington and Baltimore.

No. 19 connects at Foxburg with A. V. R. R. for Franklin and Oil City.

SUNDAY TRAINS Nos. 23 and 26 will run daily. Nos. 18 and 17 will run daily between Butler and Allegheny. No. 23 connects at Callery Junction for Allegheny and New Castle. No. 26 gets connections from Allegheny and New Castle. All other trains run daily, except Sunday.

THOS. M. KING, General Manager.

C. W. BASSETT, General Passenger Agent.

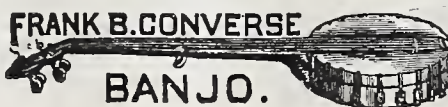
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Importer, Manufacturer and Wholesale Dealer in all kinds of Musical Merchandise, Musical Boxes, Band Instruments. Stratton's Celebrated Russian Gut Violin Strings.



THE PETROLEUM AGE.

VOL. VI.

BRADFORD, PA., OCTOBER, 1887.

No. 9.

THE GAS TERRITORY OF INDIANA.

THE topography of southwestern Ohio and southeastern Indiana gives little indication of the presence of an arch or axis of disturbance. The area of lower silurian rocks has been eroded to such a degree that their surface has more the appearance of a basin or depressed area than the crown of an arch. The upper silurian formations, which surround this area have not yielded so readily to the erosive agencies, and their areas are to-day prominent topographical features of this section, as they form an elevated rim or tract surrounding the lower silurian area on the east, north and south. This topographical feature of the crown of the Cincinnati arch has led many able geologists to question the existence of the Cincinnati axis as a line of upheaval or disturbance.

All observers have noted that the formations which skirt this axis dip rapidly to the east and southeast on one side and to the west and northwest on the other side. Not all, however, have been inclined to consider this as evidence of an upheaval in the lower silurian rocks. Those who dissent from the prevailing opinion regarding the structure of this axis are inclined to consider the phenomena observed as being due to the continental elevation which raised this whole section above the ocean's level at the close of the Palæozoic age, rather than to any arch or axis of upheaval.

Professor E. T. Cox, in discussing this question (page 6, Indiana Geological Report for 1878) says: "An examination of the hydrography, or drainage, of the district occupied by the lower silurian rocks should at once convince the most skeptical that instead of Cincinnati anticlinal it would be more proper to say Cincinnati synclinal; and, instead of dome, basin."

It is not surprising that there should not be an unanimity of opinion regarding this axis when we consider that the lower silurian rocks lie nearly horizontal, with the exception of the northerly dip of the whole series north of the Ohio river.

Professor J. S. Newberry has given in the geological reports of Ohio a very comprehensive description of this anticlinal, and the general features as described by him require no modification in the light of more recent investigation. Professor Edward Orton also contributed much to elucidate the structure of this axis in Ohio, and more recently in his "preliminary report on petroleum and gas," he has shown that all the essential features of this uplift are found in the disposition and arrangement of the Trenton limestone—a fact that could not have been determined without the aid of the drill.

Previous to the recent investigations for gas and oil in Ohio and Indiana, it was not known that a portion of the Cincinnati arch extended into Indiana. The writer first called attention to the probabilities that such was the case in the geological report of Indiana for 1882, page 188, and again in The Indianapolis News of January 28, 1887. In this last article a table was given of elevations

of the Trenton limestone at the different places in Indiana where gas wells had been drilled. Although the facts in hand at that time were meagre, the writer claimed that they were sufficient to demonstrate the existence of a fold subordinate to the main axis, and having a direction from southeast to northwest. Professor Orton arrived at essentially the same conclusion from his study of the topography of the Trenton limestone in Ohio, though he considers the portion entering Indiana to be the main body of the arch, which, in the light of more recent investigations, is most probably correct. It is probable, however, that investigations in the southeastern portion of the state will show not only the main body of the arch entering Indiana, but a subordinate fold as well, the latter entering Indiana from Kentucky.

In view of the fact that the accumulation of large quantities of gas in Indiana is so largely dependent upon the presence of this northwestern extension of the Cincinnati axis into Indiana, and as this line of disturbance is the dominating structural feature of the state, it is fitting that we describe the structure of this arch somewhat in detail, for the reason that the literature of the subject is not now accessible to a large portion of the people of Ohio and Indiana, who are interested in the discovery of gas and oil, the conditions under which it is found, and upon which its presence depends.

THE CINCINNATI ANTICLINAL.

Geologists have been cognizant of the line of upheaval which passes from the south line of Tennessee with a direction a little east of north, through Nashville and Cincinnati to Lake Erie. This anticlinal nowhere presents the topographical characteristics of a mountain range, but consists rather of a broad tract or area over which the silurian formations are the surface rocks, except in southern Kentucky, where the devonian and carboniferous formations extend across it. It nowhere presents the characteristics of a sharp ridge having an axial line from which the strata dip in opposite directions, and as the terms axis and anticlinal do not convey the correct meaning, it would be better to use the term arch, but as custom has sanctioned the use of all these terms, it is immaterial whether we say Cincinnati arch, axis or anticlinal, so long as we understand the true character of the structure to which these terms are applied.

It consists of a broad tract from 50 to 125 miles wide, from which the upper silurian and succeeding formations dip rapidly away to the southeast on the east side, and to the west and northwest on the west side. South of Nashville, Tenn., the Trenton limestone is the surface rock over a large area, including most of Wilson, Ruthersford, Bedford and Marshall counties, with a portion of the counties adjacent. The Hudson river formation is exposed in a belt surrounding the area of Trenton limestone. The formations which skirt this lower silurian area have withstood the erosive agencies better than the Hudson river and Trenton rocks so that the latter oc-

cupy a depressed area or basin. In Southern Kentucky this arch seems to have been somewhat depressed, for the carboniferous rocks extend across it, showing that this portion of the arch was not above sea level during a portion of the carboniferous age. In the valley of the Kentucky river the Trenton limestone again comes to the surface and extends northward to Point Pleasant, O., where Professor Orton has described its outcrop—the only point in Ohio where the Trenton is exposed to view. The Hudson river formation is the surface rock over a large area, surrounding the Trenton limestone, extending from central Kentucky as far northward as Dayton, O. Northward from Dayton the arch becomes relatively much lower, the upper silurian formation being exposed on its crown. It also becomes narrower as it approaches Lake Erie.

The fact that the upper silurian and succeeding formations dip rapidly away on each side from this broad tract is sufficient to demonstrate the presence of an arch or line of upheaval, notwithstanding that the lower salurian areas are depressed or basin-shaped.

During the investigations for gas in Indiana many facts have been developed that show that the Cincinnati arch was formed soon after the deposition of the Trenton limestone and before the great mass of soft material which overlies it was deposited. We may consider then the Cincinnati anticlinal or arch as having been formed during the lower silurian age, soon after the close of the Trenton epoch. Probably no portion of the arch was raised above the ocean's level at this time, but at the close of the lower silurian age there must have been two islands representing the highest points, one in Tennessee and the other in northern Kentucky and southern Ohio. Facts stated by Professors Orton, Newberry and Safford, of Tennessee, demonstrate that this axis or arch was a line of unequal disturbance, which continued until this whole section was raised above the level of the sea at the close of the Palæozoic age. In places the upper silurian formation lies upon the Hudson river rocks. In other places they are absent, and the devonian black shale rests upon the lower silurian.

The Cincinnati arch was gradually emerging from the sea during the devonian and carboniferous ages. Between it and the Blue Ridge was a great synclinal trough, now filled with Palæozoic strata thousands of feet in thickness, then an arm of the sea.

If one were to travel from the Appalachian mountains westward, there would be nothing in the surface features to induce the presence of a low and broad mountain range, but if we will follow the Trenton limestone, probably not everywhere a limestone, as it passes under the great sedimentary material lying between the Blue Ridge and the Cincinnati arch, we will find it dipping rapidly beneath the Appalachian basin until it is thousands of feet beneath the surface. After passing into Ohio we would find the Trenton gradually rising, until finally it comes to the surface on the crown of the Cincinnati arch in Tennessee, Kentucky and Ohio. To the west of this arch it dips rapidly beneath the coal measures of Kentucky, Indiana and Illinois, where it is again thousands of feet beneath the surface. The thickness of the Palæozoic formations of Pennsylvania decline to the westward, and each formation varies somewhat in thickness in different localities, still the Trenton formation must be from 6,000 to 10,000 feet beneath the surface at Pittsburg, Pa. Could we view the arch as first formed, or after the Trenton epoch: Its summit but little elevated above the

seas, if at all, its flanks gradually sloping beneath the deep water on either sides, we might form some idea of the mountain range, which, though mostly buried beneath the sea, in relative altitude, would equal the Appalachians of to-day.

The main body of the arch, after entering Ohio, with its highest point near Point Pleasant, turns gradually to the northwest and enters Indiana south of Winchester, Randolph county, and extends as far to the northwest as the Wabash valley, where it becomes relatively much lower. North of the Wabash river it has not been traced, owing to a lack of borings. Wabash City is near the crown of the arch. A sharp ridge or fold, named the Lima axis by Professor Orton, arises in Mercer county, Ohio, and extends northeasterly in the general line of the arch from Tennessee to Lake Erie. In the study of the portion of the arch north of the Ohio river, after it divides or forks, we must consider the portion in Indiana as broader and higher, and the Ohio fold, or Lima axis, as sharper and more depressed.

I have described the Cincinnati anticlinal or arch at some length because the history of the accumulation of oil and gas in Ohio and Indiana is largely dependent upon it. As the structural characteristics of the reservoirs are the dominating features of all gas fields, so here the structure of the Trenton limestone has determined the reservoirs for the oil and gas. This view has been advanced in articles previously published, and every discovery only tends to establish its truth. Not a single high-pressure gas well has yet been discovered in Ohio or Indiana where there can not be shown, where the investigations are sufficient to be depended upon, structural characteristics of the reservoir independent of its physical condition.

In order to give a better understanding of the Cincinnati arch, and the variations in the surface of the Trenton limestone, I have constructed a few sections which extend from central Ohio to central Indiana with a few others having a different direction. It is estimated by geologists that sedimentary material, six miles in thickness, accumulated in Pennsylvania during the silurian, devonian and carboniferous ages, so that in places where these rocks exist in full thickness to-day, a drill would have to be sunk to that depth before reaching the Azoic rocks beneath them.

As the strata decrease in thickness west of the Appalachian mountains, the depth from the surface to the Trenton formation in western Pennsylvania and eastern Ohio can not be definitely told. It must be thousands of feet and beyond the reach of the drill with the present appliances.

I have described this Cincinnati arch as having been a low and broad mountain range. It is low only when compared with the surface adjacent, but when we consider that the upheaval proper is confined to the Trenton limestone, and the formations underlying it, a study of its topography shows its magnitude. Like many mountain ranges of to-day that lie mostly submerged beneath the waters of the ocean, and their relative height and magnitude only determined by soundings, so must we regard the Cincinnati axis having been a mountain range mostly buried beneath the water of Palæozoic sea. After making due allowance for the subsidence which was probably a marked feature of the Appalachian basin during the Palæozoic age, we would still have the Cincinnati arch as a marked and prominent feature in the topography of the ocean's bottom. This elevated tract in the Trenton limestone extended from the south line of Tennessee through Nashville and Cincinnati to Lake

Erie, between Toledo and Sandusky. The mighty deep upon each side has been filled with sedimentary strata of more recent date, and the arch to-day buried beneath the sediments of a Palæozoic sea. This arch was not characterized by steep and abrupt slopes on each side, but was rather a broad tract, comparatively level on its summit, and from 50 to 125 miles wide. It slopes gently, but gradually increases both to the eastward and westward.

In central Ohio a few wells have succeeded in reaching Trenton rock. From the boring at Massillon, O., Professor Orton, to whom I am indebted, estimates that for the data given him from Ohio the Trenton would be found at not less than 4,000 feet below the surface. At Mansfield probably about 3,000 feet. At Crestline, twelve miles west of Mansfield, the Trenton was found 2,850 feet from the surface, or 1,650 feet below the sea level. Beginning at Crestline, O., the following towns, nearly on a straight line to Logansport, Ind., found the upper surface of the Trenton limestone, as follows:

Crestline.....	1,650 feet below sea level.
Bucyrus.....	1,235 " " " "
Upper Sandusky.....	472 " " " "
Beaver Dam.....	445 " " " "
Delphos.....	447 " " " "
Van Wert.....	434 " " " "
Decatur, Indiana.....	460 " " " "
Huntington, Indiana.....	270 " " " "
Wabash, ".....	193 " " " "
Perrin, ".....	230 " " " "
Logansport, ".....	314 " " " "

The character of the Lima axis is better shown in the section from Tiffin, O., to Fort Wayne, Ind., the Trenton rock being found at Tiffin 746 feet below sea level.

	Ft. below sea level.
At Findlay (Jones well).....	328
At Leipzig.....	746
At Paulding.....	875
At Fort Wayne.....	686

This section does not represent the true character of the Findlay arch, as the apex should be truncated and the western slope broken or having the form of terraces, near the crown of the arch. The absence of borings sufficient to demonstrate the width of the level tract on the crown of the arch, or the extent of the terraces, renders it impossible to give an exact representation. The section, however, clearly shows the size of the arch at Findlay, where it is comparatively sharp and high. A comparison with the section from Crestline to Logansport will show that the Lima arch is broken, or at least very much lower than at Findlay. One can hardly locate the arch at all, as the upper surface of the Trenton limestone is an almost level plain from upper Sandusky to Decatur. It is probably fortunate for Findlay that the Lima axis is not continuous, for with the gentle rise of the arch to the south it is quite probable that the gas would have escaped into the high table land in the Trenton limestone to the south. A careful study of the sections will show the comparatively abrupt descent to the east from the high tract in the Trenton.

The section from Columbus, O., to Crawfordsville, Ind., shows the upper surface of the Trenton limestone:

At Columbus.....	1,188 feet below sea level.
At Urbana.....	300 " " " "
At Piqua.....	307 " " " "
At Union City, Ind.....	71 " " " "
At Winchester.....	52 " above " "
At Farmland.....	45 " " " "
At Muncie.....	74 " " " "
At Anderson.....	20 " " " "
At Noblesville.....	86 " below " "
At Lebanon.....	300 " " " "
At Crawfordsville.....	711 " " " "

In this section quite a rapid rise is shown from Union City to Winchester, where, in well No. 3, the top of the Trenton is 74 feet above sea level, though the altitude as shown in well No. 2 was used in this section as probably being nearer the general level of the Trenton at

that point. Although there is a slight depression at Farmland, we may, so far as is now known, consider the portion between Winchester and Muncie as a comparatively level tract.

The presence of the fold, which, so far as can be determined at present, enters Indiana from Kentucky, is shown in the following section, where the upper surface of the Trenton limestone is found as follows:

At Dayton, O.....	120 feet below sea level.
At Eaton, O.....	40 " " " "
At Richmond, Ind.....	64 " above " "
At Connersville, Ind.....	127 " " " "
At Rushville, Ind.....	124 " " " "
At Shelbyville, Ind.....	65 " below " "
At Bloomington, Ind.....	880 " " " "

A north and south section line from Brookville to Rochester shows the upper surface of the Trenton:

At Brookville.....	175 feet above sea level.
At Connersville.....	127 " " " "
At New Castle.....	125 " " " "
At Muncie.....	74 " " " "
At Fairmount.....	40 " below " "
At Marion.....	53 " " " "
At Lafontaine, about (?).....	80 " " " "
At Wabash.....	193 " " " "
At Rochester.....	370 " " " "
At South Bend.....	850 " " " "

This section shows the northwesterly dip of the Cincinnati arch. It also strikes the mythical "Wabash arch" nearly perpendicular, and shows clearly its true structure.

The upper surface of the Trenton limestone is undulating, wells drilled within one or two miles of each other showing considerable variation in elevation. This, however, does not affect the general results, for, if the lowest elevations are used, the broad elevated tract in the Trenton is just as clearly marked. It is to the presence of this elevated tract—the northwestern extension of the Cincinnati axis—that we owe the accumulation of gas. Without this the accumulation of gas in large quantities could never have occurred, for there never would have been any large reservoir into which it could arise to escape the pressure of the salt water. It would have been scattered over a large territory, filling the crest of every wave in the Trenton, but not in sufficient quantities anywhere to warrant the expense of drilling. In the presence of a reservoir large enough to hold it, and an impervious covering, such as found in the Hudson river and Utica shales, strong enough to prevent its escape, the accumulation of ages was safe, as it had no means of escape until the drill gave it vent. Now not less than 80,000,000 cubic feet of gas is escaping every twenty-four hours.

The Indiana portion of the Cincinnati axis is the reservoir of the gas. We little dreamed, when we began our investigations, that Indiana was the possessor of one of the great natural gas reservoirs of the world. The Lima axis could be placed in one corner and the room it occupied would hardly be missed. As the writer can justly claim to be the first to call attention to the existence of this structure, and as the facts here given demonstrate beyond a doubt the extension of the Cincinnati axis into Indiana, we repeat a statement made some months ago, for the benefit of those who took especial pains to deny the truth of the position there taken:

"On the summit and on the slopes of the northwestern extension of the Cincinnati arch lies the gas belt of central eastern Indiana. It is this axis, with the cross-cut waves or arches, that determinates the belt and renders possible the accumulation of gas and oil in large quantities."

EXTENT OF THE INDIANA FIELD—DEVELOPMENTS OF THE DRILL IN THE SEARCH FOR GAS.

If we follow the high tract in the Trenton limestone

from Point Pleasant, O., to the northwest, we will find it gradually dipping to the west and the northwest. At Point Pleasant, O., it is 450 feet above sea level; at Hamilton 215 feet above sea level, and as it enters Indiana south of Union City, near Richmond, it is not over 50 feet above tide. It is at present impossible to give the exact boundaries of the portion of the arch having the upper surface of the Trenton above sea level, and the boundary given must only be considered approximately correct. Beginning at the Ohio river we may consider as above tide all that portion adjacent to the State line and extending north to within a few miles of Union City. From a point south of Union City this boundary extends northwesterly to Ridgeville where it turns to the west, passing a little north of Eaton, where it curves to the southwest, passing between Alexandria and Anderson. Curving still more to the south, it passes a few miles west of Pendleton, when it probably runs almost directly south to Greensburg, south of which point it probably bears to the east, reaching the Ohio river near Madison. As the upper surface of the Trenton limestone within this area shows considerable variation we may expect to find narrow ridges below sea level and high ridges above sea level outside of it. The main body of the high tract of Trenton that enters this State from Ohio seems to be reinforced within this area by the high ridge or fold from the south causing a widening of the arch where they join. Much remains to be learned in regard to this, however.

Outside of the area just described is one of the most important portions of the arch, as it includes a large portion of the productive gas territory. In this portion the upper surface of the Trenton lies between sea level and 100 feet below sea level. This 100 feet below sea level has so far proved to be practically the dead line for gas in Indiana. A few wells have found gas in small quantities where the Trenton was struck below this line, but the exceptions to the rule are of so little importance that for the present we may consider this as the horizon below which we need not expect to find gas in large quantities. At any rate there are nineteen chances for failure to one for success.

The boundary of this area is approximately as follows: Beginning a few miles north of Portland it extends northwesterly through Montpelier to near Lafontaine, where, curving to the west, it passes near Xenia, when it curves to the south, passing a little west of Kokomo, south of which point it swings to the east of Tipton where it again turns to the west, passing to the west of Noblesville to Broad Ripple, south of which point it can not at present be traced owing to a lack of borings. It probably, however, will be found east of Lawrence, where, with a gentle curve to the east, it extends to the Ohio river. It is a significant fact that so far not a single gas well of value has been found in the Trenton when struck below this 100-foot dead line. Should any other portion of the State show large arches in the Trenton they may prove quite productive. However, unless they are quite large, they will not be lasting, but will share the fate of the well at Fort Wayne that exhausted its reservoir in a single night. The flow of gas was quite large at first but the reservoir was too small. Wells located where the Trenton is below this horizon may yield quite a flow for a time before being drowned out by the salt water.

A careful study of the well records suggest the probability that the slopes of the arch, after passing below a certain level, descend quite rapidly, and where such is the case the conditions are favorable for productive

wells near the line where the abrupt slope begins. The monoclined or terraced slope has proven a favorable structure for the accumulation of gas. If we examine carefully the portion of the State where the upper surface of the Trenton is above 100 feet below sea level it will be seen to include most of the Cincinnati arch in this State. North of the Wabash river this arch becomes so much reduced in size and so far depressed into the salt water that it no longer acts as a reservoir so far as investigations have determined.

This one-hundred-foot dead line also gives the approximate limit of the gas belt. No doubt gas may be found outside this line, or rather this line will be extended in some directions and the productive area be somewhat enlarged, but at best the belt which extends some five or ten miles from this line will be treacherous. A high tract in the Trenton limestone enters this State from Illinois, near Kentland and probably terminates near Delphi, where it is 290 feet below sea level and full of salt water.

At Kentland the lower silurian is exposed over a small area, and the Trenton will probably show some disturbance here. This seems to be the eastern terminus of the La Salle axis of Illinois. Near La Salle this upheaval has brought the Trenton limestone and the underlying St. Peters sandstone to the surface over quite an area. Whether any portion of this arch will prove productive remains to be determined.

North of the Wabash river the Trenton dips to the northward until it is 850 feet below tide at South Bend. In the northeastern portion of the State the Trenton is far below sea level, as shown in the wells at Fort Wayne, and also those at Bryan and Wawseon, O., where it is 1220 and 1460 feet below. Professor Rominger, of Michigan, has shown that the upper silurian is reached at a depth of 1400 feet below the surface at Hillsdale, Mich., and the Trenton must lie nearly 1000 deeper, or about 1400 feet below sea level. The high tracts in the Trenton are formed along lines of upheaval, and as the extent of the depressed area in northern and northeastern Indiana would preclude the possibility even of the presence of the necessary structural features, we may consider the probabilities of finding gas in the Trenton in paying quantities north of the Wabash river very doubtful. The same may be said of the western and southwestern portions of the State.

As it can be distinctly shown that the Cincinnati arch exists even when it is all 100 feet below sea level, the question may arise why can not gas be found in it in Indiana below this horizon? This is the case in northern Ohio, on the Lima axis, where most of the gas is found between 300 and 400 feet below sea level. This Lima arch, however, is a sharp and comparatively high ridge and its continuity with the higher portion of the axis to the south is broken, consequently there is no natural means for the escape of the gas. In Indiana the arch is not broken, so far as is now known, and all the portions below the hundred-foot dead line undoubtedly have free communication with the higher portion to the south, so that whatever gas may have found its way into it has escaped to a higher level, in obedience to the laws which govern it.

The depth at which the Trenton is found below sea level has nothing to do with the accumulation of gas, provided there are ridges or arches of sufficient capacity to act as reservoirs. Further, the arch must be broken so that no communication can be afforded between it and another at a higher level, else the gas will escape. The large arches are only along lines of disturbance, and

they, of course, represent the highest portion of the rock. The eastern fork of the Cincinnati arch—the Lima axis—has been shown to be much depressed, while the main body in Indiana lies near sea level or above it. (When speaking of the Trenton limestone or the Cincinnati arch the upper surface of the Trenton is always meant, unless otherwise stated.)

Between the outcrops of the Trenton in Kentucky and Ohio on the south and Canada and northern Michigan on the north, is a deep basin in the Trenton. This limestone is a reservoir of salt water that has a tendency to rise into the higher portions of the Cincinnati arch until an equilibrium is established. The Lima axis is in its way, and if it was not for the gas and oil it would fill every crevice and porous portion in it. The arch in Indiana is higher, and the salt water has, in obedience to the laws which govern it, sought a higher level. It has risen into the arch, driving the gas before it until the resistance offered by the compressed gas is equal to the force of salt water, when it must cease to rise. The salt water horizon around the gas belt is about 100 feet below sea level; it may prove to be a little less when the belt becomes more clearly defined. The Utica shale that overlies the Trenton is impervious to water, hence the salt water horizon can only rise with the rise of the Trenton. We may consider the Cincinnati arch as a long reservoir having one end open but immersed in the salt water, the other end practically closed. Into this reservoir the gas, oil and salt water have risen. The salt water would rise until an equilibrium was established, if there was nothing to prevent it. That an equilibrium is not reached is evident from the height to which the water will rise when found in wells surrounding the gas belt as at Huntington, where it rose to 680 feet above the 100-foot dead line. This shows that the water is imprisoned in the Trenton rock under considerable pressure.

What then can hinder its passage into the higher portion of the arch? We have shown that the gas and oil would have a tendency to rise into the arch from every direction except the south and southeast, the salt water would crowd upon it until the force of the compressed gas would hold it in check. The one-hundred feet below the sea level is the salt water horizon surrounding the gas area, and it can rise no higher because the arch is full of gas and oil. The quantity of gas in the reservoir has been one of the prime factors in determining the height of the salt water surrounding the gas area. This being true, it is plain that as the gas becomes exhausted the salt water will rise until it fills the reservoir. The one-hundred feet below the sea level is the dead line for gas in this State, because below this horizon the Trenton rock is full of salt water. Should other gas areas be developed, their salt water horizon will vary with the depth at which the Trenton is found below the sea level.

It may be asked, "Why do we not find gas in all that portion of the arch above the one-hundred-foot dead line? Wells have been drilled where the Trenton was found from 50 to 175 feet above the sea level, and the results have either been failures or the flow of gas small. The investigations in the southern portion of the high area have not been sufficient, so far, to determine to what this failure is due. It will probably be shown that the rock lacks porosity.

It is not at all desirable that the cities and towns located over this high tract should not be able to obtain gas in large quantities, but it is probable that the factors, that have been instrumental in depriving them of this gift of nature, have worked for the good of our

State by preventing the escape of the gas, as would have occurred if the rock had been sufficiently porous everywhere this side of its natural out-crops. The southern end of the arch north of the Ohio river will probably be shown to be practically closed. No doubt many places will yet be found that will be fairly productive of gas south of what is now considered the southern limit of the field.—Dr. A. J. McPhinney, in *Indianapolis News*.

OIL REGION CHRONOLOGY.

FOR SEPTEMBER, 1887.

Sept. 1.—AGE oil report shows 150 wells completed in August, of which 37 are dry; new production 6847 barrels; new rigs, 56; old rigs, 101; wells drilling, 132; total field operations for August, 289; decrease from July, 28. The pipe lines report 10 wells completed in the Ohio field in August, 2 at Lima, 2 at Findlay and 6 in the North Baltimore district; wells drilling at close of month, 11. Rigs up and building, 35; daily average production for the month, 17,114 barrels. Market opened at 64½c, with a few sales at 64¼c, weakened rapidly to 64c, advanced 64½c and broke to 63½c. It then reacted slowly to 64¼c, dropped back to 63¾c, and at 2 o'clock rallied to 65¾c. It sold off to 65¼c, and the next rally carried it to 65¾c; it receded, and closed at 65¼c with considerable buying at New York and Pittsburgh; carrying rates, 35c and 40c. Phillips' No. 5 on the Behm farm, Reibold, reported at 120 barrels per hour; Markle No. 12, 350 barrels a day from the 100 foot sand. Washington—Martin No. 5, 30, No. 6, 5, No. 7, 25; Fergus No. 3, 40, No. 4, 7, No. 5, 50 No. 6, 22 and Cameron No. 11, 10 barrels per hour. Ten thousand people attend the Warren Fair. Firemen's Parade at Bradford attracts a great crowd; Governor Beaver reviews the gas-light procession in the evening. Trotting race at Fostoria, O., held at night with track illuminated by natural gas.

Sept. 2.—Market opened at 65½c, reacted to 64¾c, advanced to 65¾c, broke to 64c with few reactions, and closed at 64¾c bid. Reibold—Behm No. 5, 125 barrels an hour. Bolard well near Saxonburg, Butler county, reported good for 30 barrels a day. Washington—Martin No. 5, 24, No. 6, 8, No. 7, 25 barrels an hour; Fergus No. 3, 46, No. 5, 47, No. 6, 22 barrels an hour. Thayer well, Taylorstown, finds 11 feet of sand and makes several flows. The Ohio Oil Company organized at Lima, O., with a capital of \$500,000; will operate independent of the Standard.

Sept. 3.—Market opened at 64½c, advanced quickly to 65½c, receded to 64¾c, rallied to 65c, broke to 64¼c and closed at 64¾c bid. Washington gauge, 10,640 barrels from 211 wells. Martin No. 5 makes 600 barrels in the last 24 hours. Taylorstown included with above, 1530 barrels from 17 wells. Anchor Oil Co.'s No. 2 on Cundall farm, Taylorstown, reaches the sand. Fergus No. 3, 43, No. 4, 7, No. 5, 51, No. 6, 23 barrels an hour. Caldwell well on Carrother's farm, Taylorstown, tubed and showing for small producer. Thayer well, Buchanan farm, doing 22 barrels a day.

Sept. 4.—Sunday. Phillips' 5 well, on the Behm farm Reibold, doing 100 barrels an hour. Washington—Fergus No. 3, 44, No. 5, 45, No. 6, 20 barrels an hour. Martin No. 5, 25 and No. 7, 14 barrels an hour. Cundall No. 2, Taylorstown, made 190 barrels in 13 hours.

Sept. 5.—Market opened at 64¾c, advanced steadily to 65½c, sold down to 65c, and closed at 65½c. New York Exchange closed on account of Workmen's Holiday in New York State. Washington—Martin No. 5, 25, No. 7, 16 barrels; Fergus No. 3, 33, No. 5, 37, No. 6,

16 barrels an hour. Cundall No. 2, Taylorstown, completed and good for 200 barrels. Reibold—Phillips' Behm, No. 5, is doing 95 barrels an hour. Grand demonstration of laboring men, in honor of Labor Day, held at Titusville.

Sept. 6.—Market opened at 65 $\frac{5}{8}$ c, weakened to 65 $\frac{1}{4}$ c and rallied to 66 $\frac{3}{8}$ c the first half hour; it receded to 66c, advanced to 66 $\frac{3}{4}$ c, and after numerous fluctuations closed at 65 $\frac{3}{4}$ c bid; carrying rates, 35c to 40c. Reibold—Phillips' Behm, No. 5, 90 barrels an hour; production of the pool, 6294 barrels from 83 wells. Washington—Martin No. 5, 25, No. 7, 14; Fergus No. 3, 33, No. 5, 37 and No. 6, 18 barrels an hour. General Assembly of the Producers' Protective Association hold three sessions at Bradford. Nearly one hundred delegates present.

Sept. 7.—Market opened at 65 $\frac{7}{8}$ c, with a few sales at 65 $\frac{3}{4}$ c, advanced steadily with few reactions to 68 $\frac{1}{4}$ c, sold off to 67 $\frac{7}{8}$ c, boomed to 68 $\frac{7}{8}$ c, weakened and closed at 67 $\frac{3}{4}$ c bid. Reibold—Behm No. 5 declines to 83 barrels an hour, but when drilled fifteen minutes increased to 100 barrels an hour. Bolard & Greenlee's well at Saxonsburg, put in pumping order. Collins & Co. get a 200 barrel well on the Hodge farm, Kinzua Village, Toledo, O., holds a natural gas jubilee. Governor Beaver visits the Venango County Fair at Franklin. John McSorley, of Titusville, meets with an accident at the Keystone Refinery, Oil City, and loses his right leg.

Sept. 8.—Market opened at 67 $\frac{7}{8}$ c, rallied sharply to 69 $\frac{3}{8}$ c, sold back to 68 $\frac{7}{8}$ c, then advanced to 69 $\frac{3}{4}$ c; it settled back to 69 $\frac{1}{8}$ c, made another spurt to 70c, receded to 69 $\frac{1}{4}$ c, reached 69 $\frac{1}{2}$ c, broke to 68 $\frac{3}{4}$ c, again advanced to 69 $\frac{1}{2}$ c, weakened and closed at 69c bid. The Bolard & Greenlee well at Saxonsburg, Butler county, starts pumping 40 barrels a day. Reibold—Behm No. 5 off to 82 barrels, but again increased by deeper drilling to 100 barrels an hour. An oil strike reported at Kilmaster, Mich. General Assembly of the Producers' Protective Association adjourned sine die. The corner stone of new Consolidated Petroleum Exchange laid with imposing ceremonies at New York.

Sept. 9.—Market opened at 69 $\frac{1}{4}$ c, advanced to 69 $\frac{3}{4}$ c, sold back to 69 $\frac{1}{4}$ c, then to 68 $\frac{3}{4}$ c within thirty minutes. It rallied again to 69 $\frac{1}{4}$ c, sagged off to 68 $\frac{5}{8}$ c, advanced to 69 $\frac{3}{8}$ c and closed at 69 $\frac{1}{4}$ c bid; carrying rates, 35c to 50c. Behm No. 5 drops off to 80 barrels and again raised to 100 barrels an hour by the drill.

Sept. 10.—Market opened at 69 $\frac{3}{4}$ c, one-half cent above yesterday's closing, advanced quickly to 70 $\frac{3}{4}$ c, receded to 70 $\frac{1}{4}$ c, then under New York buying boomed up to 71 $\frac{1}{4}$ c; it sold off slowly to 71c, broke to 70 $\frac{1}{2}$ c, reacted to 71 $\frac{1}{8}$ c and closed at 71c bid. Washington gauge, 9389 barrels from 215 wells. (Taylorstown included with Washington) 1793 barrels from 18 wells. Martin No 5, 276 barrels a day. Reibold—Phillips', Behm, No. 5, 88 barrels an hour; Root & Johnson's No. 4, Blakeley, started at 15 barrels, increased to 40 barrels an hour, and suddenly checked by running into a heavy salt water vein. Reibold gauge, 6425 barrels from 86 wells. Bolard well at Saxonsburg, pumps 40 to 50 barrels a day. T. J. Mahoney, the alleged Clarendon incendiary, acquitted by a Warren jury. The Valley Flouring Mills at Titusville, destroyed by fire; loss \$36,000; insurance \$12,000.

Sept. 11.—Sunday. Postoffice and jewelry store at Tarport entered by thieves who secured \$75 worth of plunder. John Somerville, an employee of the Forest Oil Co., suffocated by natural gas on the Forest lease, near Duke Centre.

Sept. 12.—Market opened at 71 $\frac{3}{4}$ c, advanced to 72 $\frac{1}{4}$ c,

broke to 71 $\frac{1}{4}$ c before 10:30 a. m. It rallied to 72 $\frac{7}{8}$ c, and after numerous fluctuations boomed to 74 $\frac{3}{4}$ c and closed at 74 $\frac{3}{8}$ c bid. Carrying rates: Pittsburgh, 35c; Bradford, 45c; New York, 50c; Oil City, 65c. Reibold—Behm No. 5 increased from 85 to 100 barrels an hour by a few pricks of the drill. John Costello seriously injured on the P. & E. Railroad at Warren while attempting to pass through the train. Important meeting at Pittsburgh of representatives of the Producers' Protective Association and members of producing firms connected with the Standard Oil Company.

Sept. 13.—Market opened at 74 $\frac{5}{8}$ c, advanced to 74 $\frac{7}{8}$ c, weakened to 74 $\frac{1}{8}$ c, made a lively rally to 74 $\frac{1}{2}$ c, sold off slowly to 73c, reacted to 73 $\frac{1}{2}$ c, receded to 71 $\frac{1}{8}$ c, and at 2:40 p. m. broke to 68c. It closed at 68 $\frac{1}{4}$ c bid. Reibold—Behm No. 6 starts at 10 and increased to 120 barrels, and then to 140 barrels an hour; No. 5, 85 barrels an hour. Field doing 9000 barrels a day. Washington—McKeown Martin No. 8 ten bits in the sand, with 700 feet of oil in the hole; Davis Bros. No. 1, Davis farm, made 85 barrels first 24 hours. Manufacturers' Gas Company begin the work of pipe laying in Bradford.

Sept. 14.—Market made another big break. Opened at 68 $\frac{1}{2}$ c, advanced to 68 $\frac{3}{4}$ c, and sold off to 66c in short order. It reacted to 66 $\frac{1}{2}$ c, broke to 64 $\frac{3}{4}$ c, rallied to 66 $\frac{5}{8}$ c, receded to 65 $\frac{1}{2}$ c, firmed up to 67c, and then weakened rapidly to 62 $\frac{3}{8}$ c. There was a small rally to 63 $\frac{3}{8}$ c, but it again sold off until 62c was reached, and closed at 62 $\frac{1}{8}$ c bid. Carrying rates, 35c to 50c. Reibold, Behm No. 6, 110 and No. 5, 75 barrels an hour. B. F. Brundred's barn at Oil City destroyed by fire. Loss \$1800.

Sept. 15.—Market opened at 62c, rushed up to 63 $\frac{5}{8}$ c in less than five minutes, settled off to 63c, weakened to 62 $\frac{1}{8}$ c, rallied to 63 $\frac{1}{2}$ c, and at 2.30 p. m. advanced to 64 $\frac{1}{8}$ c, then to 65c, and closed at 65c bid. Advance started by heavy buying in New York. Failure of a heavy trader in New York Consolidated Exchange. Washington, McKeown, Martin, No. 8, starts at 30 barrels an hour. Reibold, Behm, No. 6, 120, No. 5, 71 barrels an hour. B. N. Y. & P. R. R. sold to Carl Schurz for \$1,900,000. Clark & Warren's refinery at Corry, sold to F. E. Mulkie, Cashier of First National Bank, for \$130,000. Twelve thousand people attend the Butler County Fair.

Sept. 16.—Market opened at 65c, broke to 64 $\frac{5}{8}$ c, advanced to 66c, then to 66 $\frac{5}{8}$ c, broke to 65 $\frac{3}{4}$ c, and at 1.45 p. m. rallied to 67c. It then started on its downward course and closed at 64 $\frac{1}{4}$ c. Reibold, Behm, No. 5, 75, No. 6, 100 barrels per hour. Peiffer, No. 2, 15 feet in the sand with no oil. Washington, McKeown, Martin, No. 8, 20 barrels an hour, No. 9, nearly through sand with hole full of oil. The Government Bank Examiner closes up the First National Bank of Corry.

Sept. 17.—Market opened with some excitement at 64 $\frac{3}{4}$ c, advanced to 65c, weakened to 64c, and closed at 64 $\frac{1}{2}$ c. Reibold gauge 7287 barrels from 87 wells. Goehring No. 1, and Peiffer, No. 2, both reported dry. Behm, No. 6, 90, and No. 5, 58 barrels an hour. Washington production, 9755 barrels from 217 wells. Refinery of Lewis Morton, near Harmon, West Virginia, fired by an incendiary. Loss \$10,000. E. Strong resigns as manager of the Oil City Fuel Supply Co. Body of G. R. Brundage, of Emporium, missing since Spring, found near Columbus, Pa.

Sept. 18.—Sunday.

Sept. 19.—Market opened at 64 $\frac{1}{2}$ c, rallied sharply to 65 $\frac{3}{4}$ c, settled off to 65 $\frac{3}{8}$ c, advanced to 65 $\frac{5}{8}$ c, receded to 65 $\frac{1}{8}$ c and closed at 65 $\frac{3}{8}$ c bid. Carrying rates, 35c to 45c. Reibold—Behm No. 5, 70, No. 6, 85 barrels an

hour; Goehring No. 1 finds a little oil and salt water in the "hundred foot" and will be drilled to fourth sand: Root & Johnson, Blakeley, No. 5 has declined to 12 barrels an hour. Washington—The important wells of this field gauge as follows per hour: Fergus No. 3, 28 barrels, No. 4, 2 barrels, No. 5, 33 barrels, No. 6, stopped flowing. Martin No. 5, 22, No. 7, 14, No. 8, 17 barrels. Davis Bros. No. 1, 60 barrels a day.

Sept. 20.—Market opened at 65½c, rallied to 65¾c, sold off to 65¼c, advanced to 65½c, settled to 65c, then broke to 63¾c on report of panic in the stock market, reacted 64¼c, receded to 64c and closed at 64½c bid. Reibold—Behm No. 5 increased from 63 to 70 barrels an hour; No. 6 drilled deeper and increased to 120 barrels an hour. Parker & Van Wormer well near North Baltimore, takes fire and 6000 barrels of tankage with oil destroyed. George Johnson seriously burned. Loss \$20,000. Veterans of McKean county hold a reunion at Bradford.

Sept. 21.—Market opened firm at 64¾c, advanced to 65c, receded to 64½c, and at 12:20 reacted to 65¼c. It settled back to 64¾c, rallied with wide fluctuations to 66¾c and closed at 66¼c bid. Reibold—Behm No. 6 drops off to 90 and increased to 120 barrels an hour; No. 5, 70 barrels an hour. Haymaker well, Saxonburg, Butler county, reported a failure. Washington—Martin No. 5, 23, No. 8, 16; Fergus No. 3, 28, No. 5, 33 barrels an hour. Natural gas found at a depth of 308 feet at Conneautville, Pa. Fire on North Seneca street, Oil City, destroys J. D. Hellmer's furniture store and J. T. Parsons' carriage and blacksmith shops. Loss \$5000.

Sept. 22.—Market opened at 66¾c with sales at 67c, weakened to 66¼c, and at 12 o'clock broke to 65¾c. It made a lively rally to 66¼c, and then advanced to 68½c. It sold off to 68c, boomed up to 68¾c, broke to 67¼c, and closed at 67½c bid. Reibold—Behm No. 6 increased from 100 to 125 barrels and at 3 p. m. was making 115 barrels an hour. Erie freight train breaks in two at Crawford Junction, and a brakeman named Barnes is killed.

Sept. 23.—Market opened at 67¾c, advanced to 68c, sold off to 67¾c rallied to 68¾c, broke to 68¼c, again advanced to 68¾c, weakened gradually to 67¼c, reacted and closed at 68¾c bid. Carrying rates, 40c and 45c. Reibold—Peiffer No. 2 showing for a light producer. Behm No. 5, 60, No. 6 averages 100 barrels per hour for last 24 hours. Washington—Fergus No. 5, 34, No. 6, 29; Martin No. 5, 22, No. 8, 14 barrels an hour. Cundall No. 3, Taylorstown, starts at the rate of 250 barrels a day. Parker has a grand natural gas illumination and gas light parade. Close of the Fair of the Oil Creek Valley Agricultural Association at Titusville.

Sept. 24.—Market opened at 69c, sold off with few reactions to 68½c, advanced to 68½c, receded to 68c, broke to 67½c, rallied to 69½c and closed firm at 68¾c bid. Washington gauge, 8758 barrels from 219 wells, including 19 wells at Taylorstown doing 1665 barrels. McKeown's, Martin No. 5 made 552 barrels the past 24 hours. Behm No. 6, 90, No. 5, 60 barrels an hour.

Sept. 25.—Sunday. Death of George Wood, editor of Olean Daily Times.

Sept. 26.—Market opened at 68¾c, and sold off to 68c the first five minutes. It reacted to 68¾c, declined to 68½c, advanced to 68¾c, sagged off to 67¾c and closed at 68c bid. Washington—Fergus No. 3, 27, No. 5, 31; Martin No. 5, 23 barrels an hour; Reibold—Behm No. 6, 80, No. 5, 55, barrels an hour; Root & Johnson No. 5 increased to 20 barrels an hour. Natural gas causes a \$1000 explosion at Buffalo. Producers' Association hold a ses-

sion at Buffalo. Jerry Fraley seriously injured near Egypt, Venango county, while taking down an iron tank.

Sept. 27.—Market opened at 68½c, sold off rapidly to 67¾c, reacted to 67¾c, sagged off to 67c, then to 66¾c, firmed up to 67¼c and closed at 67½c bid. Carrying rates, 35c and 40c. Reibold—Behm No. 5, 52, No. 6, 78 barrels an hour. The Z. Markle No. 2, which was down to 10 barrels an hour, found another pay streak at 40 feet in the sand, and increased to 30, then to 50 barrels an hour. Root & Johnson, Blakeley, No. 3, 15 and No. 5, 20 barrels an hour. Well on R. Noble farm, Taylors-town, strikes sand and pronounced good for 150 barrels a day. Democratic Convention at Smethport. National Transit Co.'s gas well, No. 31, between Kane and Halsey, burned. Two men slightly injured.

Sept. 28.—Market opened at 67½c, sold down to 66½c, rallied to 67c, sagged off to 66½c, advanced to 67¾c and closed at 67¼c. Reibold—Phillips Z. Markle No. 2, 50 barrels an hour; Behm No. 5 increased from 48 to 85 barrels an hour; Behm No. 6 from 70 to 108 barrels an hour; Stahm No. 5 reaches the lower sand. Washington—Martin No. 5, 22, Fergus No. 3, 26, No. 5, 32 barrels an hour. A 600-barrel agitator explodes at International Oil Works, Titusville. Loss \$1500.

Sept. 29.—Market opened at 66¾c, advanced to 67c, broke to 66¾c, reacted slowly to 67¼c, then to 67¾c, sold back to 67¼c and closed at 67¾c. Reibold—Z. Markle No. 2, 38 barrels an hour this morning, and made 1065 barrels last 24 hours. Behm No. 5, 48, No. 6, 75 barrels an hour. Stahm No. 3, 18 barrels an hour in the morning; when 25 feet in the sand increased to 25 barrels an hour and at 3 p. m. was 40 feet in the sand and making 100 barrels an hour. Markle No. 2 increased by agitation to 56 barrels an hour. Marvin A. Happer, a brakeman on the Erie Railroad, killed at Carrollton.

Sept. 30.—Market opened at 67¼c, broke to 67c and reacted sharply to 67¾c. It settled back to 67½c, advanced to 68¾c, declined to 63c, rallied to 68¾c and closed at 68½c bid. Carrying rates, 35c to 40c. Reibold—Hourly gauge this evening: Z. Markle No. 2, 38; Behm No. 5, 60, No. 6, 70; Stahm No. 3, 72 barrels. Four wells made 6300 barrels for 24 hours ending this morning.

A Kentucky Natural Gas Company.

C. H. Andrews, Youngstown, O., O. P. Shaffer, Wallace C. Andrews, Gen. Daniel E. Sickles and Gen. Thomas Crittenden, of New York, have been elected to the Board of Directors of the Kentucky & Cincinnati Natural Gas Company. The capital stock of the company is \$3,000,000. The company has under lease 200,000 acres of oil and gas territory in Kentucky.

WM. J. DIEHLE, Secretary of the Wheeling Natural Gas Company, has issued a statement to the stockholders, in which they are informed that the capital stock issued is \$940,000; stock in treasury not issued or used, \$60,000; total indebtedness, \$172,000. The gas supply of the company is now greater than ever. It has been decided that the indebtedness need not be increased, but should be rapidly reduced. To do this the payment of dividends will be suspended until this has been accomplished.

THREE wells will be drilled for natural gas near McKeesport. One of them is for the National Tube Works Company, and another is for the Versailles Gas Company, which already has a powerful well within two miles of the city.

THE OIL SPIDER.

ANOTHER WYOMING WONDER DESCRIBED BY GEO. R. CALDWELL.

Who has heard of the great spider of the Bonanza oil district—the oil spider, who seeking out circular crevices in rocky ledges transforms them into small oil wells by filling them with oil generated by his own body, and transforms those wells again into lamps by placing in them wicks woven by himself?

The oil spider is numerous in the Bonanza oil district, and is perhaps the largest spider in existence, the gigantic tarantula not excepted. His very color is indicative of his nature, being the light yellow hue which is the distinguishing mark of the most valuable of the many valuable oil varieties of the Bonanza district, Big Horn basin. The oil spider is furnished with long, double-jointed, muscular legs, and his gait is much faster than a man's walk. He is a most active, persistent and business climber, and is nearly always seen traversing cliff and ledge in the prosecution of his mission of finding and filling his rock-hollowed lamps, being apparently never stationary, except when engaged in the task of making a wick for a lamp already filled.

The task of the oil spider is a regular one. He works on a perfect system. He first finds a crevice in the surface of a ledge, or the face of a cliff, suited to his purpose. This crevice he cleans out with a scrupulous cleanness. By the help then of the grasping claws attached to the muscular legs, and a certain rough horn-like substance with which each of the double joints of these legs is covered and defended, every inequality is smoothed away or removed entirely, until the interior walls of the cavity present a uniform surface. The mere cavity in the rock, being carefully and anxiously prepared, is now filled with oil generated by the spider for that purpose, and becomes a tiny but perfect oil well. The next step of the industrious and curious worker is to transform this well into a lamp, and this he now proceeds to do. A strong web is thrown completely over the mouth of the well. Then comes the more laborious and extraordinary weaving of the wick. This is a work of great care, and the weaver consumes a great deal of time in his task. The wick filaments are strongly spun and are woven together with the most anxious care. When completed the wick is about an eighth of an inch in thickness and about an inch in width, its length depending on the depth of the particular well, or lamp, to be filled. The spider spins the wick from the centre of the web thrown across the well-mouth, and as fast as it is woven the wick is immersed in the oil. The completion of the task leaves the wick fully an inch above the web which crosses the well, or rather now the lamp. The spider then proceeds to gather fine earth which he sprinkles thickly over the web, finally finishing his task by covering this fine earth with a mucous secretion, the object being apparently to prevent the web from taking fire from the ignition of the wick.

The process of oil generation by the spider is in itself a sufficient curiosity. The animal is furnished with an absorbing apparatus which extends, apparently, all over its body, being a net work of minute valvular glands. The spider buries himself in the seepage from an oil spring, and thus absorbs oil through every pore of his skin. As the oil passes in it is refined by a natural process and is gathered as pure oil in a large sack designed for that purpose. The process of absorption and generation is very rapid, a wise provision of nature, as the spider is frequently compelled to fill and empty several sacks in

obtaining enough oil for a single lamp.

When the oil spider is disturbed on his journeys to and fro he evinces a most pugnacious disposition, raising himself on his hind legs and giving vent to an angry and long "blow." This "blow" has a gushing sound, and reminds the listener strongly of the gush and blow of an oil well when tapped by the drill. The "blow" emits a strong odor of petroleum, and it can always be easily determined whether the spider is on his way to empty or fill his sack, as in the former case the odor is much stronger than in the latter.

The cliffs and ledges of the Bonanza district are honey-combed with these lamps of the oil spider, and the oil men of the section jealously guard them, as it is intended to welcome the first railroad that traverses the region with a general, grand and unique illumination from this source.—*Mountaineer*.

The New York Exchange Lays the Corner Stone of Its New Building.

The Consolidated Stock and Petroleum Exchange of New York laid the corner-stone of its new building September 8, with appropriate ceremonies, before a large assemblage of the members and their friends. There were present President Chas. G. Wilson, who delivered an appropriate address; Mayors Hewitt, of New York, Whitney, of Brooklyn, and Cleveland, of Jersey City; Congressman S. S. Cox, Judge Lawrence, Senator Gorman, of Maryland; representatives of other Exchanges; O. D. Baldwin and H. W. Cannon, bank presidents; United States Commissioner Osborne and President Wheeler of the Bradford Oil Exchange.

Frederick R. Coudert delivered an able address calling attention to the fact that sixty millions of people required greater facilities for transacting their daily business, which this organization having been quick to realize, was deriving the benefits accruing therefrom; had it not done this, it would not now be able to construct this magnificent building which we here see being erected. He dwelt upon the fact that an active, eager, busy nation cannot be satisfied with the agencies and methods that suited its forerunners. He told the Exchange men that they must expect opposition in business affairs. They had heard the blast of the trumpet of the enemy, but there was only one case on record where the walls crumbled at the blast of a trumpet, and the blast was blown by an angel. Another appropriate speech for the occasion was that of the Hon. Algernon S. Sullivan. He touched a live topic when he spoke of "Trusts" and the members listened closely. He said: "Certain combinations called 'Trusts' are rapidly coming into existence. Their plan is to get control of all corporations which are engaged in some one department of industry. By bringing them under one general controlling superior they pervert the management of these corporations from the hands to which the law committed them. And above all, they lift up impious hands against the law, which, to an American, should even be as sacred as was the Ark of the Covenant to the armies of Israel."

After Dr. Rylance had given the parting prayer, and the singing of the doxology by the Glee Club, a handsome collation was spread at the Hoffman House cafe, in the Wells building.

THE Honeoye Gas and Mining Company struck a small gasser near Honeoye, Ontario county, N. Y., on August 9, at a depth of 610 feet. It is a few miles from the celebrated Bloomfield well, and indicates that a large area of low pressure gas territory exists in western New York.

Pittsburgh's Supply of Natural Gas.

During the summer months, while Pittsburghers were refreshing themselves at the seashore or in the mountains, and while business of all kinds was lying low, the natural gas companies have been hard at work. Big mains have been laid from the great gas fields to the city and to the suburban towns, lateral pipes have been laid along the streets and thousands of connections have been made with residences. Out in the districts new wells have been drilled, additional property has been secured and everything possible has been done to secure for the people of Pittsburgh and vicinity an unlimited supply of fuel and light. In the city where coal once was king, of about all it surveyed, it will this year be an almost unknown quantity.

The Philadelphia Company have laid over 40 miles of pipe during the summer. From the great Murrysville wells they have run new mains down along the river and have piped the towns of Sharpsburg, Etna and Parnassus. Several miles of pipe have also been laid in the East End. Out the Panhandle, the towns of Crafton, Ingram and Idlewood have been supplied with gas brought in from the Washington district. The upper hill district of the city and Knoxville on the Southside have also been thoroughly piped. Over 500 new house connections have been made in the city during the summer and 2000 more will have been made by November.

The demand will be very great, but the supply will be greater. The Philadelphia Company have a total of 90 wells in the Washington and Murrysville districts. Twenty of these have been drilled during the summer. During the fall eight more will be brought in in the Canonsburg district. The company have now a daily capacity of 200,000,000 cubic feet of gas. They could, if necessary, it is thought, supply more than that amount. Small tracts of territory are being secured gradually as the old ones show signs of weakening. So many mains have been laid to the city now that a failure of the gas supply this year is a practical impossibility. If one main breaks the gas can instantly be turned into another without more than a momentary inconvenience to consumers.

The People's Company have laid 20 or 25 miles of pipe through the streets of the city during the summer. Beginning down near the Point, they have been piping a block or two here and there which they formerly did not have possession of, until their net work of mains extends almost all over the city. As the name of the company indicates, chief attention is given to the supplying of dwelling houses. The company now have their pipes on almost every residence street in the city. Orders for gas are coming in very rapidly. Probably 1500 or 2000 new connections will be made during the fall. Two or three additional tracts of land have been secured in the Grapeville district and several new wells are being put down. New wells are also being drilled at Murrysville. The company's supply of gas is now so large that a failure to meet all the demands that may be made on them is scarcely possible.

A good deal has already been said about the work of the Chartiers Company. Their big new main from Murrysville to Pittsburgh, which is to connect with the 20-inch main at Thirty-first street and carry gas to mills along Penn avenue, has been described, as has also the work they have done over on the Southside, where they now practically have control of the field. They have made a large number of house connections and expect to make plenty more. They will also supply quite a

number of additional mills and factories. The new main will be finished by the latter part of September, after which there will be no danger of a break in the supply, such as occurred on the Southside some time ago. Several wells in the Hickory, Canonsburg and Murrysville districts are on top the sand and ready to be brought in at any time.

The Manufacturers' Company brought in a big well in the Canonsburg district a short time ago. Another is in or due. The company has now all the gas it can use. A new six-inch main has been temporarily laid from the new well. It will be replaced by a much larger one shortly. During the summer Knoxville, Mt. Oliver and a portion of the lower Southside have been piped. New house connections are being made all the time and orders are coming in faster than they can be filled.

None of the gas companies have been doing more hustling than the Baden. Starting at the town of Baden, its lines have been stretched out both up and down the river until they cover the entire string of towns from Beaver to Allegheny. The low pressure line recently finished to Rochester connects with the Rochester Heat and Light Company's line and supplies 2000 residences in Rochester, Bridgewater and Beaver.

Up the other direction the main line supplies the Ohio Valley Company's pipes at Sewickley, carries fuel to all the little towns between Baden and Allegheny, and finally supplies the People's Light and Heat Company, of Pittsburgh's sister city, with all the gas they can use. Altogether during the summer the company has laid over 25 miles of pipe, and has taken contracts that will run its business up to more than \$200,000 a year. Its 16 big wells in the Baden field are turning out an immense amount of fuel, much more than can possibly be utilized.

The People's Light and Heat Company of Allegheny will supply a big portion of that city with gas the coming winter. Since spring it has laid over 35 miles of pipe and has taken contracts to supply something like 2500 dwelling houses. As has already been said, the company gets its gas from the Baden Company.

The Bridgewater Company is spreading itself all over the Beaver Valley. From its wells in the Shannopin districts it is laying a big main down across the Ohio river at Bridgewater, and from there up the Beaver, and along the line of the Lake Erie road to Youngstown. Connections will be made with all the towns along the route. The line will be finished before winter sets in. Quite a number of new wells have been brought in lately in the Shannopin district and more are being drilled. The Bridgewater Company is also making a large number of house connections in Rochester and vicinity.—*Dispatch.*

The Average Price of Crude.

The following table gives the average price of crude certificates, on the floor of the Bradford Oil Exchange, since March 1, 1879:

MONTH.	1879	1880	1881	1882	1883	1884	1885	1886	1887
January	110 1-5	95	83	92 3/4	111 1/3	70 3/4	88 1/4	71	
February	103 1/4	89 1/4	85 1/4	101	104 3/8	73 1/8	80	63 3/8	
March	86	89	82 3/8	80 3/8	97 1/2	100 3/8	80 3/8	77 1/8	63 1/4
April	78 3/8	76 3/8	84 1/8	78 1/4	92 3/8	91	78 3/8	74	64 1/2
May	73 1/2	80 1/4	81 1/2	70	99 3/8	85 1/2	79 3/8	69 3/8	61
June	68 3/8	100 1/4	81	54 1/2	117 1/4	68 3/8	82 1/8	67	62 3/8
July	69 3/8	101 1/4	76 1/8	57 3/8	108	63 1/8	96 3/8	66	59 1/4
August	67 1/4	0 3/4	78 3/8	58 3/8	108 3/8	81 1-5	100 3/8	62	60
September	69 3/4	9 1/2	92 1/4	71 3/8	112 1/2	78	100 3/4	63 3/8	67
October	88 3/8	96 3/4	92 3/4	93 3/8	111 1/8	71	105 1/2	65 3/8	
November	105 3/8	91 1/4	82 3/8	114 3/8	114 4-5	72 1/2	104 3/8	72	
December	113 1/4	92 3/8	83 3/4	95 1/4	114 3/8	74 3/8	89 3/8	71	

The Macksburg Field in September.

The production of the Macksburg field, estimated from the pipe line runs, the shipments of the West Virginia Transportation Company, etc., averaged about 229 barrels a day for 1884. The gross runs of the Macksburg pipe line since January 1, 1885, with the estimated amount of oil shipped from the field through other channels is given below. The averages represent the best obtainable figures on the production of the field:

1885.	Macksburg P. L. Runs.	Outside Shipments. Est	Daily Average Production.
January	11,894	1500	432
February	20,625	1500	790
March	27,067	1500	922
April	40,527	1500	1400
May	48,258	1500	1605
June	64,982	1500	2216
July	75,737	1500	2492
August	74,228	1500	2443
September	68,110	1500	2320
October	63,619	7000	2278
November	60,926	7000	2264
December	61,113	7000	2197
Total	617,086	34,500	1785
1886.			
January	54,806	7000	1934
February	49,694	7000	2025
March	58,795	8973	2116
April	64,137	7890	2401
May	58,586	6850	2104
June	55,379	2871	2275
July	58,410	4080	2016
August	57,492	2790	1945
September	48,918	1240	1672
October	46,937	3240	1619
November	41,359	4090	1515
December	40,578	3040	1407
Total	645,101	53,844	1682
1887.			
January	37,134	4500	1343
February	28,514	1200	1061
March	32,549	7400	1015
April	29,128	4200	1110
May	24,700	1500	970
June	18,609	3300	1010
July	23,443	3500	880
August	25,710	2700	900
September	22,081	1000	770

There were no wells completed in the Macksburg field in September nor August. Only one well was drilling at the close of the month, with two rigs up and building. One well was abandoned during the month, and on September 30th there were 467 wells in the field, and the daily average production was 770 barrels. About 20 wells have stopped flowing and a marked decline is noticeable from the August average. At the close of August there were 468 wells in the field, with a total daily average of 900 barrels.

The Cambridge Light and Fuel Company struck a vein of heavy oil on the first of October, in their well on the Dr. Clark farm, a mile northeast of Cambridge; a considerable quantity of oil appeared, and good judges estimate that it will make from 5 to 10 barrels a day when tubed. The oil was found on top the salt sand. Carr Bros. have a well near Kimbolton, about eight miles north of Cambridge, shut in and guarded. It is supposed to be a gasser, and little importance is attached to it.

THE EUREKA DISTRICT.

In the Eureka, West Virginia field, the tools have been fished out of the "Burned Well." Brown No. 3 has the tools fast at a depth of 1200 feet, and two rigs are building in the immediate vicinity of the producing wells.

PARKER'S LANDING is making great endeavors to boom its natural gas advantages. The town was extensively illuminated on the occasion of the County Fair, which was held Sept. 20 to 23, last.

New Gas Companies of Pennsylvania.

In the February, 1887, number of the AGE we published a complete list of the natural gas companies of this State, with capital stock and names of principal stockholders. Following is a list of all companies chartered by the State since that date which brings the list up to October 1st:

Appollo Gas Company, Armstrong county, Appollo. Capital stock, \$20,000. Geo. W. McMurty, C. W. Bachelor, J. I. Buchanan, O. H. Childs, Wallace P. Bache, D. Buchanan.

East Brady Caloric Company, Clarion county, East Brady. Capital stock, \$15,000. A. W. Marshall, Frank J. Weixell, James Hart, Campbell K. Smith, Geo. H. Moore.

West Middlesex Gas Light and Fuel Company, Mercer county, West Middlesex. Capital stock, \$3,000. T. A. Walker, T. J. Hyde, W. J. Davidson, A. A. Keith, Andrew Dickey.

Rochester Heat and Light Company, Beaver county, Rochester. Capital stock, \$30,000. Perry Brown, J. W. Conway, H. M. Camp, Wm. P. McConnell, A. W. McCoy.

The Marlin & Clark Gas, Heat and Light Company, Jefferson county, Brookville. Capital stock, \$2,000. W. D. J. Marlin, E. J. Marlin, E. H. Clark, M. H. Clark.

Presque Isle Natural Gas Company, Erie county, Erie. Capital stock, \$11,500. W. L. Scott, J. D. Downing, M. Griswold, C. M. Conrad, Chas. Brander, Oliver & Bacon, Crouch Bros.

Jefferson Heat and Light Company, Jefferson county, Brookville. Capital stock, \$20,000. W. G. Bishop, S. Chambers, R. Stewart, B. M. Marlin.

Royal Gas Company, Philadelphia. Capital stock, \$520,000. Wm. McLaughlin, Chas. O. Kinger, Chas. S. Smiley, Wm. H. Magoffin, J. S. Martin.

Pike Run Natural Gas Company, Washington county, Coal Centre. Capital stock, \$30,000. Henry Hornbake, W. H. Gregg, McKenna Oil Co., J. A. Leatherman.

Duquesne Natural Gas Company, Pittsburgh. Capital stock, \$10,000. W. H. De Wald, H. M. Bowman, Thos. B. Booth, Frank Boyce, Frank X. Barr.

Citizens' Gas Company, McKean county, Kane. Capital stock, \$5,000. James McDade, J. T. Griffith, G. H. Preston, N. M. Orr, Wm. Turby.

Mt. Jewett Gas Company, McKean county, Mt. Jewett. Capital stock, \$10,000. Elisha K. Kane, Thos. L. Kane, David T. Hall, Jno. D. Leonard, Jno. D. Broder.

THE total exports of petroleum from America, in gallons, according to a German circular, from January 1 to September 9, for the years 1886 and 1887, have been as follows:

	1887. Gallons	1886. Gallons.
To Europe	276,966,706	268,838,418
To East Indies, etc	81,419,133	98,950,480
Total	358,385,839	367,808,898

THE Union Gas Company struck a strong flow of natural gas at Boone's Landing, Ind., twenty-five miles down the Ohio river from Louisville, Ky., at a depth of 400 feet, on the 27th of August. A capacity of from 9,000,000 to 17,000,000 cubic feet per day is claimed for it.

NATURAL gas was struck near Ellsworth, Kan., Sept. 18th, at a depth of 1190 feet. The drill in this well passed through a vein of salt 160 feet thick.

NATURAL gas is said to have been discovered in Freeborn county, Minnesota.

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THE PRODUCING REGION.

AT the beginning of September there were 56 new rigs and 132 drilling wells in the New York and Pennsylvania oil region, a total of 188. The number of wells completed in September was 130, with an estimated new production of 2094 barrels. The dry holes numbered 34, leaving 96 productive wells, with an average yield of $21\frac{3}{4}$ barrels. In August the new producing wells were 115 in number, and they averaged $59\frac{1}{2}$ barrels each. In July there were 127 new wells and their average output $16\frac{1}{2}$ barrels. In June there were 144 productive wells finished, which averaged 44 barrels each, and the dry holes were 35 in number. The new wells in May averaged 29 barrels, the April 49 barrels, the March wells $42\frac{1}{2}$ barrels, the February wells $65\frac{1}{2}$ barrels, and the January wells 30 barrels each. The September figures show a decrease of 22 wells and of 4753 barrels in the new production from those of the month preceding. At the close of September there were 4 wells in the Reibold field which were producing at the following rate per day: Phillips, Behm, No. 5, 1392 barrels; No. 6, 1680 barrels; Zeno, Markle, No. 2, 840 barrels; Stahm, No. 3, 1260 barrels. As these wells had already appeared in the list of the completed wells of preceding months, their increased yield could not be counted as new production. In some of the reports sent out from the region, these wells appeared for the second time in the completed list, and their yield swelled materially the estimates on new production. On September 1st three of these wells were yielding as follows from the "100-foot" sand: Behm, No. 5, 95; Behm, No. 6, 210; Stahm, No. 3, 57 barrels a day. The August report had a decrease of 10 completed wells and an increase of 4754 barrels in the new production. The July figures showed a decrease of 17 wells and of 4287 barrels new production as compared with the figures for June. June revealed an increase over May of 33 wells and 3198 barrels new production. May had a decrease of 23 wells and of 3056 barrels new production, while April recorded an increase of 36 wells and of 2451 barrels in the new production over March. In September, 1886, there were 253 wells completed, including 36 dry holes, and the new production was 13,540 barrels.

At the close of September there were 56 new rigs, 106 old rigs and 121 drilling wells in the entire region, a total of 283, as compared with 56 new rigs, 101 old rigs and 132 drilling wells, a total of 289 at the close of August. This is an increase of 5 old rigs and a decrease of 11 drilling wells, or a net decline of 6 in active operations from the figures of August 31. The August figures were 28 less than those of July. July showed a decline of 4 from the June record, while June declined 36 from May and May 7 from April. April had a decrease of 9 in rigs and drilling wells from the March report, while March showed an increase of 7 in active operations

over February, February a decrease of 40 from the January report, January a decrease of 48 from December and December of 95 from the November figures. At the close of September 1886, the record showed 121 new rigs, 138 old rigs and 322 drilling wells, a total of 581.

THE ALLEGANY FIELD.

Four productive wells and two dry holes is the story of the Allegany field for September. Only three wells were completed in August, and two in July. The dry holes of the past month were both gassers, one on lot 25, Wirt, drilled by the Empire Gas Company, and the other on lot 44, Wirt, put down by the Allegany Gas Company. At the close of the month 2 new rigs and 3 drilling wells were under way, but 33 old rigs are still standing in various parts of the field.

THE BRADFORD FIELD.

The Bradford field is almost as quiet as that of Allegany. In many sections nothing at all is doing, and little work in the way of cleaning out old wells and preparing for the winter months is being done anywhere. Twelve productive wells were completed in September, and 10 in August. The well drilled at Port Allegany, McKean county, by Arnold, Dolly and Co., to the east of the defined limits of the district, is the single failure that appears in the Bradford list. At the close of September there is 1 new rig and 4 drilling wells in the field, as compared with 6 new rigs and 11 drilling wells at the close of August.

WARREN AND FOREST.

There were 33 new wells completed in the Middle field in September, including 10 dry holes, and the new production was 279 barrels. This is a decrease of 12 wells and of 61 barrels production as compared with the figures for August. On the last day of September this division of the producing region showed 12 new rigs, 29 old rigs and 28 drilling wells, against 13 new rigs, 25 old rigs and 24 drilling wells on the last day of August.

KINZUA VILLAGE.—The Morse estate's well, No. 8, on the Hodge farm, which started at 250 barrels a day, has dwindled down to a 15 barrel producer. No. 3, which was ranked among the failures on the first of the month, is now producing about 5 barrels a day; it is considered a very small well for the district west of the river. No. 9, completed since the first of the month, is doing 100 barrels a day. The test well of Collins & Phillips on 5546, about midway between Kinzua and Wardwell, at this writing, is still drilling. Smith, Bright & Co., and Sill, Odell & Co. are taking a rest, which will probably be a long one. The McCalmont Oil Company and C. P. Collins, manager of the Morse estate, will follow the example of the two firms above mentioned.

In the Clarendon district the Citizens' Mutual Gas Company of Clarendon, struck a good gas well on lot 52, and it is reported that the Independent Gas Company of Warren has secured some territory in the same locality. J. L. McKinney & Co. have completed their work for the present at Tiona, and only a single well was drilling in that locality at the close of the month. James Welsh secured another producing well in the southwestern end of the Balltown field, and Grandin & Co. have located a test well on the Dusenbury lands about three miles in advance of Welsh's operations. Grand Valley is almost completely shut down and the last wells completed are of the smallest calibre.

The investigations of Wood & Stewart and Bovee & Duck, in Harmony township, Forest county, for an outlet to the Kernochan well on the Kepler tract, were not rewarded with any great measure of success. Bovee & Duck's well when shot showed for two barrels a day,

while Wood & Stewart's venture was a total failure. The latter firm will make another trial on the Bromley farm, while Black Bros., of Pleasantville, have located a well on the Connelly lands. S. S. Stewart & Son completed a dry hole on Johnson Run. John J. Carter secured a couple of good producers on his purchase of Dr. Shamburg at West Hickory, and has four more drilling wells under way. The Pennsylvania Gas Company keeps one string of tools drilling for gas in the Ludlow district, Warren county.

ELK COUNTY, ETC.—Nothing of importance was developed in Elk county during the month of September. Three wells of the usual order were completed. Since the first of October the Gillis Farm Oil Company's venture on subdivision 2 of tract 1799, has been pronounced a failure, while the Sill & Odell test, in the southeastern corner of 3779 is showing up considerable gas, but no oil. The Armstrong & Boggs test, four and a half miles to the northeast, was also a duster. The Taylor, Torrey & Murphy well in the southeast corner of warrant 2027, is doing 4 barrels a day. The deep territory in this field requires a comparatively small amount of casing.

The National Transit Company has completed two more gas wells in the Wilcox district, one on warrant 2684 and the other on 2685, McKean county. Three producers of oil have been found by Shultz & Co., on warrant 2676, in the very midst of the great gushers. At last accounts Nos. 1 and 2 were each doing 8, and No. 3 17 barrels a day. No. 4, which was completed since the first of the month proved a duster.

THE LOWER COUNTRY.

There were 78 wells completed in the Lower Country in September, 21 of which failed to find oil; the new production was 1706 barrels, a decrease of 16 wells and of 4795 barrels production from the August figures. On the 30th of September the Lower Country had 41 new rigs, 18 old rigs and 86 drilling wells, as compared with 35 new rigs, 21 old rigs and 91 drilling wells on the 31st of August.

VENANGO.—There has been no decline in the activity of the Venango county fields during the past month. The operations scattered along the outlying portions of the numerous little producing areas, make an important aggregate when collected and summed up. Shamburg is less active than heretofore. Eight wells were completed in September and half of them were failures. Black's experiment on the Sanney farm, southwest of the present development, and overlooking the Oil Creek Valley at the Miller farm, was a total failure. Shamburg & Watson found a dry hole on the Walter Sedoras farm, Miller & Crippens one on the Lytle tract, and Charles Everett brought in another on the Cherry Run tract, in the direction of Pithole. Slab Furnace is moderately active. Two small gassers were completed in the Tarkill district. Sheasley & Galbraith found a big producer on the Brandon farm, at Mt. Hope. It started at 100 barrels and gradually increased, under the pump to 160 barrels a day. Venango completed 40 wells in September, including 11 dry holes; this is a decrease of 10 wells from August. At the close of September there were 21 new rigs and 30 drilling wells under way, as compared with 22 new rigs and 24 drilling wells at the close of August.

BUTLER AND ARMSTRONG.

The operations of the last 30 days at the Reibold front have been important to the field and the outlines which the drill may pencil for it in the future. The well on the inside curve of the Connoquenessing at the extreme

western end of the Goehring farm about 1200 feet north of Phillip & Osborne's No. 6, on the A. H. Behm farm, has been drilled through the sand and was found to be a small affair. The old Lappe failure is about 100 rods south of the well on the Goehring and the streak which is running to the west or northwest must pass between these two limiting barriers. The No. 3 on the Stahm farm which produced considerable oil from the 100 foot, made a regulation Reibold gusher when it was drilled to the third sand. Phillips & Osborne's No. 5, on the George R. Behm farm had a production of 10 barrels per hour when at its best. Phillips & Osborne's No. 2, on the Peiffer farm, 3500 feet ahead of the gushers on the Behm farm and 800 feet north of the No. 1 on the same farm, is a small producer from the 100-foot, but a failure in the deep sand. Their No. 4 on the Stahm farm will be allowed to produce from the 100-foot and will not be drilled deeper during the reign of the shut down. Slagle & Co. who purchased Peter Smick's interest on the Miller farm drilled their No. 2 and found it to be dry. The well of Weller, Golden & McBride at Saxonburg has of late absorbed the attention of the trade and thrown Reibold in the shade. On Friday evening, Oct. 14th, the well was 12 feet in the sand and flowing 16 bbls per hour. On the morning of Oct. 15th it had declined to 9 bbls per hour. The geographical situation at Saxonburg is summed up as follows: The wells on Thorn Creek which take the name of the Saxonburg development are 480 rods south of Jefferson Centre, and 400 rods west of the old town of Saxonburg. Bolard, Greenlee & Co.'s well, on the Lonitz farm, was the first profitable well completed in this section. It is found near the banks of Thorn Creek, and is said to have had 56 feet of sand. If reports are true this well has been kept back and not allowed to do its best, to prevent its being crowded by parties who have adjoining leases. The Saxonburg pool is located at a point where a line drawn from the old Thorn Creek pool would intersect one drawn from the good wells at Herman Station, both having the general direction of their respective belts. At the close of the Thorn Creek excitement operators who had made money in that section, and others who had tried to and failed, continued to prospect to the southeast and up Thorn Creek as far as Jefferson Centre in a southeasterly direction. Bolard, Greenlee & Co.'s well is 5 miles from the old McBride well, in the Thorn Creek field. A line of dry holes has been traced all along the creek to the Christie well, on the Adderhold farm. There are gaps between some of these dusters through which a belt crossing the stream at an angle approaching a right angle might easily pass. This famous creek has its source at Herman Station, on the West Penn Railroad. It flows southwesterly for a distance of two miles, then almost due south for three miles to the new wells which are attracting so much attention. From these wells it turns to the west, and then sweeps to the northwestward through the old Thorn Creek gushers, and empties into the Connoquenessing near the Renfrew or Baldrige development.

The record of some of the wells which have served as indicators to the new pool may prove of interest. The Extension Oil Company, which consists of Gibson, Gahagen and others, drilled a well on the Lloyd Welsh farm at Jefferson Centre which created a mild furore on account of making a showing of oil. The well was cased at a depth of 455 feet, struck the sand at 1664 and stopped drilling at 1711. So far as can be learned it had a shallow thickness of sand and if pumped would make a small producer. The Extension Oil Company's second ven-

ture in this section was on the W. Rudert farm, three-quarters of a mile northeast of the No. 1 on the Welsh. This well was completed in September, 1886, and has the following record: The well was cased at 510 feet. There were two layers of sand or rather a third and a fourth sand with a layer of slate between them. (In the old Thorn Creek field this break in the sand was first noted at Reep, Sutton & Clark's well on the McLaughlin farm.) The third sand was reached at 1620 and had a thickness of 42 feet. The fourth sand was tapped at 1688 feet and measured 37 feet in thickness. The drill stopped at this well 1867 feet below the surface. The well disclosed the existence of a good body of sand which was entirely barren of crude. On the Welsh farm, nearly due west of Jefferson Centre, James G. Haymaker & Co. found 27 feet of sand and have a display of crude which warrants a small producer. About 50 rods down the creek and southwest from the Golden, Weller & McBride well, H. Christie, of Butler, drilled an important test well and came near making the strike which his northern and near neighbors have gained. The sand at this well, which had a thickness of 70 feet, was tapped at a depth of 1647 feet. This well was quite gassy, had a showing of oil and would have made a small producer. About 80 rods to the west of the Christie well on the Adderhold farm, K. H. McBride & Co. sunk a dry hole on the R. Smalley farm. It was finished last June and had 20 feet of third sand and four bits of fourth sand. Three-quarters of a mile west of the Golden, Weller & McBride well on the Lonitz, two wells were drilled a long time ago. The one on the Frazier was sunk by Joe Overy and others in 1872. The one still further down the creek was drilled by some farmers fourteen years ago at a cost of \$20,000. Still further down the crooked stream we come to the wells drilled by Gillespie, Christie and Harley in the order named.

The Golden, Weller & McBride well on the Lonitz farm is about 100 rods down Thorn Creek and southwest of Bolard, Greenlee & Co.'s well, and the distance from the latter well to the Christie on the Adderhold is about a half mile. If the field develops into a streak the setting of dry holes and small wells which it has would seem to turn it in a northwesterly and southeasterly direction. The well has not been drilled deep enough and enough governing points have not been established by the unfeeling drill to enable one to draw correct conclusions or make predictions in regard to the outlines of the field.

WASHINGTON.

The old Washington field has failed to make any demand on the attention of the speculative trade during the past 30 days. On the 8th of October John McKeown's No. 5 on the Martin farm, was producing 480 barrels per day, and the 221 wells in the Washington field had a yield of 8803 barrels. John McKeown has one well drilling on the Martin farm and another on the Munce. At Taylorstown the wild cat wells now under way will furnish governing points for helping to determine the outlines of the field. The Ten Mile Oil Company's venture on the southern part of the Work farm a half mile northwest of the well on the Woodburn farm, is fishing for tools in the stray sand above the Gordon, where quite a heavy vein of gas was struck. At J. M. Guffey & Iseman's well on the McLain farm, a big vein of gas has been tapped which will not permit the tools to be lowered. This vein of gas was struck 30 feet above the Gordon sand and is a new feature in the development of this end of the field. This well and B. B. Campbell & Aiken's on the Miller farm, are important

ones to the southwestern end of the field. The production of the 20 wells in the Taylorstown field on the 8th of October was 1851 barrels.

Below is a list showing the production of wells by groups on the different farms which make up the total of the Washington field for September 10, and October 8, 1887:

Farm.	Operator.	Number of wells, Sept. 10.	Production Sept. 10, Bbls.	Number of wells, Oct. 8.	Production Oct. 8, Bbls.
Gordon, P. L. & H. Co.		81	5	86	
Hess,		13	3	21	
Weirich, Forest Oil Co.		43	2	32	
Hall,		4	37	4	2
Barre,		13	616	15	476
Taylor, Union Oil Co.		7	191	7	188
Morgan,		8	119	8	131
Davis,		7	430	7	385
Dye,		1	15	1	12
Workman,		3	78	3	28
McGovern,		1	25	1	25
Clark,		1	1	1	1
Zelt & Curry, Associated Producers Co.		2	10	2	8
Wiley & Martin,		2	13	2	11
Gantz & Wiley, Citizens' Oil & Gas Co.		2	31	2	29
Weaver,		2	22	2	14
Clark, Hallam & Co.		1	5	1	5
Taylor, Galigan & Young		2	40	2	40
Clark, R. H. Thayer & Co.		6	97	6	105
Munce, John McKeown		12	304	12	266
Martin,		7	681	9	957
Quail,		1	576	1	480
Smith, Willets & Young & Chartiers O Co		1	5	1	5
Cameron,		6	81	6	29
Wright, Chartiers O Co & F W Andrews.		11	464	11	386
Fergus, Chartiers Oil Co.		3	73	3	57
Stewart, Fisher Oil Co.		6	2125	6	1625
Lead Lot, Marsh & Caldwell		1	33	1	15
"McKeever & Mulholland		1	22	1	22
Fair Grounds, Wheeling Oil Co.		1	15	1	12
Cradle Factory Lot, Miller		3	43	3	38
Hall Lot, Guffey & Co.		2	55	2	40
Linn, Coast & Co.		1	5	1	5
Hayes & Weirich, Coast & Co.		3	48	3	37
Shir's, Shirls.		2	19	2	16
Manifold, Pew & Emerson.		3	32	3	42
Gabby,		2	50	2	48
Martin, Central Oil Co.		1	5	1	5
McGahey, Mascot Oil Co.		4	145	4	144
Miller, (Bunghole well), Reid & Co.		4	81	4	68
Montgomery, McKinney & Co. & Robbins.		2	10	2	15
Thome, Chartiers Oil Co & F W Andrews.		1	0	1	0
Wade, B. B. Campbell.		5	218	5	190
Weaver, Hart Bros.		1	12	1	10
Thome, Lee & Shank		2	30	2	25
Wiley, Munhall & Co.		2	7	2	11
McKean & Van Kirk, Caldwell & Co.		2	13	2	3
Whittlesee.		2	100	2	90
Watson, Butler & Co.		2	11	2	6
Martin, Allen & Co.		1	16	1	14
Munce, I Willets & Son		26	400	27	515
Montgomery, Montgomery & Co.		1	7	1	10
McNary, Craig & Co.		1	5	1	3
Welsh, Reed & Co.		1	28	1	23
Haoper, Happer & Co.		1	10	1	10
Davis, Davis Bros.		1	1	1	65

TAYLORSTOWN.

J & D McMannis, W Va Nat Gas Co.	2	141	2	116
Noble,	2	315	2	311
Donohy,	1	95	1	100
Cars on,	1	7	1	8
Flack,	1	112	1	107
Hodgens,	1	120	1	100
Carrothers,	1	90	1	80
R Noble	1	1	1	112
Blayne, Marshall Oil Co.	3	260	3	190
Carrothers,	1	50	1	50
"Caldwell & Co.	1	10	1	8
Woolburne, W O Co & Craig	1	178	1	180
Cundall, Vandergrift, Reed & Aiken	2	395	3	447
Buchanan, Thayer & Co.	1	20	1	12

Total	201	8710	221	8803
Date.	No. of wells.	Production Barrels.		
September 10, 1887	201	8710		
October 8, 1887	221	8803		
Difference	20	93		

THE Lima Natural Gas Co., which is made up of the Lima Drilling Co., Dr. A. C. Baxter and others, has completed its 21 miles of 8-inch pipe from the wells near St. Mary's to Lima. W. H. Mandeville and H. M. Ernst, who are members of the Lima Drilling Co., are moving spirits in the gas company.

THE petroleum refiners of the United States consume about 9,000,000 pounds of sulphuric acid per month.

THE OIL FIELDS OF NORTHWESTERN OHIO.

THE range of country in which the oil pools of Ohio are found extends from Toledo, on Lake Erie, as far to the southwest as St. Marys, in Auglaize county, a distance on an air line of 80 miles. It has been demonstrated that the Trenton rock underlying Lucas county will afford oil at two points. In Sylvania township, in the northwestern quarter of lot 20, the Glass Sand Company have a well which will make a profitable producer. Southwest of Toledo a good well has been found on the Maumee river at Waterville. The development at North Baltimore, in Wood county, 30 miles south of Toledo, surpasses all others that have been discovered in the Ohio field for the size of its wells and the richness of its territory. West of the town of Findlay the oil streak and the gas belt are found side by side, as they are in the Kanc field. The main field at Findlay is found west and southwest of the town of Findlay. At Cannonsburg, about midway between Findlay and Lima, the producing area is contracted and only a few good wells have been discovered. The Cincinnati parties who struck the first well have the field to themselves. The Lima field, i. e., the one at Lima, is the oldest and has the largest amount of developed territory. The Pittsburgh, Fort Wayne & Chicago Railroad practically furnishes the northern boundary line of the development or pool, and on the south it extends as far as Criderville and Hume, having a length in this direction of about 10 miles. The western boundary line of the belt is placed a mile to the east of the L. E. & W. Railroad, until the Auglaize county line is reached when the rank smelling crude currents turn sharply to the westward. The width of this streak of oil runs from three and a half to four miles. Hence there is in sight at Lima an area 10 miles in length by 4 in width. There is a small well at Kossuth, which is 6 miles west of Hume and after the line of development passes the L. E. & W. Railroad its western defines have not been established. Three miles west of the town of Wapakoneta, on the Fisher farm, Treat, Mallory & Jones finished a fair well last February. It did not demonstrate the existence of any territory that will be operated while Lima crude commands 15 cents per barrel. Several paying wells have been found at St. Marys, one of which was good for 100 barrels at the start. Southwest of St. Marys in Auglaize and Mercer counties the gas wells are located from which the city of Lima will draw its fuel supply. The oil territory of the Buckeye State is spotted and dry holes are found inside of the demonstrated lines of the producing territory.

NUMBER OF WELLS AND PIPE LINE RUNS.

At the close of September the Pipe Line report of operations in the Ohio fields showed 5 wells drilling around Lima and 8 about North Baltimore, including 2 shut down top of the sand, making a total of 13. Eight wells were completed in September, 3 in the Lima district, none at Findlay and 5 at North Baltimore.

Up to the first of April, 1887, about 430 wells had been drilled in the oil fields of northwestern Ohio. At that date there was a total of 372 wells producing oil from the Trenton rock, distributed as follows: Lima, 283; Findlay, 81; North Baltimore, 8. The following table is made up from the field reports, published by the Pipe Lines:

Productive wells to April 1	372
Productive wells completed in April	54
“ “ May	44
“ “ June	27
“ “ July	22
“ “ August	10
“ “ September	8

Total number of wells Oct. 1 537

THE BUCKEYE PIPE LINES.

The Buckeye Pipe Line is doing the bulk of the business in handling the product of the Lima field. The price paid for the oil has been gradually reduced from 35 cents to 15 cents a barrel, but even on the basis of prices, about one-fourth of that of the Pennsylvania product, stocks have accumulated until above three million barrels are now held in iron tanks waiting for consumption. The shipments from the field have been comparatively small, although every effort is being made to introduce it for fuel purposes. The runs, shipments and stocks of the Buckeye Pipe Line are fully set forth in the following:

STATEMENT OF THE BUCKEYE PIPE LINES.

	Gross Stock	Sediment & Surplus	Total Liabilities	Receipts	Deliveries
1886.					
June				23,851 13	
July				36,461 85	
Aug.				50,001 41	
Sept.				70,455 73	
Oct.	287,428 89	8,433 89	278,995 00	127,467 74	3,518 42
Nov.	401,472 72	7,672 32	395,800 40	121,153 31	4,347 91
Dec.	534,994 94	8,329 39	526,665 55	137,982 22	7,117 07
1887.					
Jan.	663,232 51	11,485 03	651,747 48	131,011 30	5,929 37
Feb.	864,978 53	17,161 89	847,816 64	20,026 36	10,957 21
March	1,141,769 53	23,481 12	1,118,288 41	303,084 30	32,612 53
April	1,429,664 54	36,478 52	1,393,186 02	352,797 59	77,859 98
May	1,795,840 97	54,898 82	1,740,942 15	449,062 47	101,306 34
June	2,183,079 94	72,042 81	2,111,037 13	474,535 17	104,440 19
July	2,413,226 34	87,015 64	2,326,210 70	389,997 34	174,823 77
Aug.	2,714,412 75	81,585 05	2,632,827 70	490,862 13	20,019 01
S pt.	3,036,856 77	78,956 41	2,957,900 36	465,743 37	30,944 14

INDEPENDENT PIPE LINES.

Schofield, Shurmer & Teagle, the well-known outside refiners of Cleveland, have a pipe line connected with the wells which they purchased from A. A. Hopkins. They have thirty-five wells with a production of from 8000 to 10,000 barrels per month.

The Excelsior Pipe Line runs the oil produced by James Apple and C. J. Garvey, and takes about 1500 barrels per day from outsiders. They sell crude oil for fuel purposes, and claim to be running the Eagle refinery to its full capacity in making illuminating oil. They have two stills at the refinery and are building three more.

THE OHIO OIL COMPANY.

About the first of September a number of the oil companies and large individual producers organized the Ohio Oil Company, with a capital of \$1,000,000. Altogether the parties pooled 130 producing wells and 6000 acres of producing territory. The object of the combine is to get in better shape to secure a higher price for the Lima product and to find markets outside of what the country now affords. Another motive in aggregating the properties was to avoid the pursuit of that ancient folly of protecting the lines, and to limit the drilling to a large number of acres to the well. In forming the company appraisements were made on the different properties which were turned in for stock. The stock of the company is paid by this plan and is not assessable. The officers of the company are as follows: H. M. Ernst, President; J. R. Leonard, Vice President; E. M. Cobb, Secretary; J. C. Lineman, General Manager; W. H. Mandeville, J. C. Lineman and C. P. Collins, Trustees. The eleven directors chosen are H. M. Ernst, W. H. Mandeville, J. C. Lineman, James McCormick, J. R. Leonard, John Kerr, Frank Holmes, C. P. Collins, S. Breckenridge, E. M. Cobb and S. M. Jones. The main office of the new company is in Lima, and J. C. Fair-

child, formerly of Bradford, is chief accountant. On the 10th of October the company paid its first monthly dividend of one per cent.

Crude Market for September.

The movement on the part of the producers to restrict the output of crude, was made the motive for a strong advance in oil certificates early in September, which reached its limit at 75c; and then suddenly collapsed. Reports of a proposed shut down to take effect at various specified dates, have been rife, and all speculative movements have been based upon vague guesses as to its progress. The Producers' Protective Association has held several conferences with representatives of the Standard Oil Company, and both parties seem desirous of the same object: To reduce the surplus stocks and enhance the value of crude petroleum. The producers' association is thoroughly organized, and is laboring hard to bring about harmonious action on the part of all interested in the great industry of producing oil.

The outlook in the field has had only a slight influence upon speculative values. The deepening of several wells in the Reibold district that had been producing from the "100-foot" rock, resulted in bringing in three or four gushers of the first magnitude, and brought Reibold once more into prominence. Washington furnished nothing of a sensational character in September, while Taylorstown, six miles to the westward, is gradually increasing its yield, and showing a productive area of considerable magnitude. Production, on the whole, has steadily declined and the statistics of the situation were never more bullish than at present.

The month of September, started in with 64½c bid at Bradford, 64¾c at Oil City, 64¾c at New York and 64¼c at Pittsburgh. There was a firm feeling apparent in all the exchanges, but the market did not reach the 70c point until the 8th. On the 13th values strengthened to 75c, and at Pittsburgh 75½c was bid for a few moments. These were the highest figures of the month, as a desire on the part of the longs, to realize, started a selling movement that carried prices back to 68c the same day. The following day there was another break of six cents, and the market sold down to 62c in all of the exchanges. On the 15th the lowest point for the month, 61¾c, was touched at Pittsburgh. After this there was a partial reaction which carried prices to 69¼c the ensuing week, and the month closed at 68¾c to 68½c bid in the several exchanges. The highest quotation for August was 65c and the lowest 56¾c.

The range of prices for September was 13¾c, as compared with 8¾c in August, 7¾c in July, 3½c in June, 5¾c in May, 6¾c in April, 4c in March, 9¾c in February, and 4¾c in January. The average price on the floor of the Bradford Exchange was 67c in September, 60c in August, 59¼c in July, 62¾c in June, 64c in May, 64¼c in April, 63¼c in March, 63¾c in February and 71c in January. The average price for September one year ago was 63¾c.

THE CLEARANCES.

	September B. rels.	August. Barrels.
Bradford Oil Exchange.....	37,942,000	20,414,000
Oil City ".....	72,096,000	39,238,000
New York Consolidated Exchange.....	153,010,000	85,926,000
Pittsburgh Petroleum Exchange, est.....	75,215,000	41,715,000
Total.....	338,263,000	187,293,000

I HAVE Five Thousand Acres of Land that I want developed on shares or for an interest. It is on a line of a railroad, and if there is anything in surface indications, this will certainly prove to be a very rich oil and gas territory. Any responsible parties meaning business can address D. P. A., Lock Box 33, Richmond, Ky.

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A PRACTICAL TREATISE ON PETROLEUM—Comprising its origin, geology, geographical distribution, history, chemistry, mining, technology, uses and transportation, together with a description of gas wells, the application of gas as fuel, etc., by Benjamin J. Crew; with an appendix on the Product and Exhaustion of the Oil Regions and the Geology of Natural Gas in Pennsylvania and New York, by Charles A. Ashburner, M. S. C. E., Geologist in charge Pennsylvania Survey, Philadelphia. Illustrated by 70 engravings and 2 plates. In one volume, 8vo, 508 pages, price \$4.50. Sent by mail, free of postage, to any address in the world, by THE PETROLEUM AGE, Bradford, Pa.

NATURAL GAS AND PETROLEUM.—Preliminary Report on Petroleum and Inflammable Gas in Ohio. By Professor Edward Orton, State Geologist.

This is the only volume which treats at length of the new horizon of gas and oil in Ohio and Indiana, viz.: the Trenton Limestone. The conditions under which gas and oil are found under this rock, the districts within which they can be looked for with most promise of success, and the reasons for failure or success in particular districts are pointed out. The most practical modes of measuring the flow of gas wells ever published are described in this volume. Price, bound in paper, \$1.00; bound in cloth, \$1.25. Sent postpaid to any address on receipt of price. Address THE PETROLEUM AGE, Bradford, Pa.

New Gas Company at Millerstown.

The Citizens' Light and Fuel Co., of Millerstown, Butler county, Pa., has been organized and a charter applied for. The following officers were elected at a meeting of stockholders October 6: A. E. Barnhart, President; C. E. Peirce, Vice-President; J. G. Gaisford, Secretary; H. T. Myers, Treasurer; Directors, J. W. Tittley, C. J. Westermann, W. A. Dennison, A. A. Hoch, H. C. Litzinger, A. Fleeger, C. F. Peirce, D. B. Campbell and C. H. Johnson.

The company has a gas well of 150 pounds pressure, within three miles of the borough. The stock is \$10,000, divided into 500 shares of \$20 each. Messrs. A. Fleeger, W. A. Dennison, John Tittley, Westermann Bros. and Hoch, Barnhart & Co. each control fifty shares; the balance is divided into small lots. The present price of gas is \$2 for the first stove and a decline of 25 cents for each additional stove. This company proposes to reduce rates 50 per cent. to start on. It is intended to have the gas piped to town ready for use by November 1, 1887.

The Western & Atlantic Pipe Line.

The Western & Atlantic Pipe Line Company was chartered at Harrisburg September 19. It is a Pittsburgh enterprise to pipe oil from the Washington field. The capital stock is \$50,000, and among the stockholders are Joseph W. Craig, E. T. Houston, Alexander Hamilton and Chas. W. Baker of Pittsburgh, and Geo. L. Craig, of Allegheny. The new line expects to supply the Globe Oil Works, Miller's refinery in Allegheny, the Bear Creek, Waverly and other independent refineries, and made its first run of oil October 11th. The first oil pumped was from the Fergus farm wells and was put in tanks at Johnston Station. The company expects to have the line completed to Pittsburgh by the 21st. The line will extend into the Taylorstown field and will have a capacity of 5000 barrels a day.

GEORGE W. MELLY, Samuel Hensch and Benjamin Kendig have formed a company for the purpose of prospecting for natural gas near Harrisburg, Pa.

The Gas Wells of Indiana.

Dr. Plinney furnishes the Indianapolis *News* the following list of places in the State of Indiana where natural gas has been found in paying quantities:

Of the large wells we have the Fairmount; open pressure $3\frac{3}{4}$ pounds, $5\frac{1}{8}$ -inch casing; capacity, 11,500,000 cubic feet per day. The McCullough well at Anderson; open pressure 26-16 pounds, $5\frac{1}{8}$ -inch casing; capacity, 9,795,000 cubic feet per day. Hartford City No. 2; 2 pounds open pressure, $5\frac{1}{8}$ -inch casing; capacity, 8,990,000. The following wells have a capacity exceeding 5,000,000 cubic feet per day: Nos. 5 and 7 at Kokomo; No. 5 at Marion; the Jonesboro well, No. 2, at Fairmount; the Wainwright and Enterprise wells at Noblesville; No. 6, at Anderson. The following have a daily capacity varying from 3,000,000 to 5,000,000 cubic feet per day: Nos. 1, 3 and 5, at Anderson; Nos. 1 and 2, at Greenfield; the Kimberlin well, the Mallory and perhaps two or three others near Noblesville; Elwood, No. 3 (?); Summitville well; Greentown well (?); Selma well, and Dunkard, No. 1.

The other large wells range from 1,000,000 to 3,000,000 cubic feet a day, while the smaller paying wells have a daily capacity of from 150,000 to 1,000,000 cubic feet.

The following shows the towns that have found gas in paying quantities:

Portland, 6 wells; Dunkirk, 2 wells; Red Key, 1 well; Camden, 1 well; Winchester, 1 well; Union City, 1 well; Farmland, 1 well; Montpelier, 1 well; Muncie, 7 wells; Eaton, 1 well; Shideler, 1 well; New Corner, 1 well; Albany, 1 well; Yorktown, 1 well; Selma, 1 well; Spiceland, 2 wells; Hagerstown, 2 wells; Knightstown, 2 wells; Middletown, 1 well; Morristown, 1 well; Lawrenceburg, 1 well; Greenfield, 2 wells; Noblesville and vicinity, 16 wells; Arcadia, 1 well; Cicero, 1 well; Sheridan, 1 well; New Brittan, 1 well; Fisher's Station and vicinity, 4 wells; Windfall, 1 well; Frankton, 1 well; Elwood, 3 wells; Alexandria, 1 well; Pendleton, 1 well; Fortville, 1 well; near Lawrence, 1 well; Swayzee, 1 well; Upland, 1 well; Summitville, 1 well; Amboy, 1 well; Xenia, 1 well; Lafontaine, 1 well; Millersville, 1 well; North Marion county region, 7 wells; Kokomo, 7 wells; Marion, 6 wells; Anderson, 6 wells; Fairmount, 2 wells; Greentown, 1 well; Rushville, Greensburg. Shale gas at North Vernon seems to be quite persistent. Petroleum has been found in small quantities at Francesville, Cicero, Peru, Montpelier, Winchester, Brightwood, Greenfield, Royal Centre, Bryant and Warren.

Oil Strike at Greenfield, Indiana.

Trenton rock was reached at the Gray-Martindale syndicate well in the northern part of Greenfield, Ind., on the morning of October 3, at a depth of 995 feet. After penetrating the rock 6 feet the drill struck a mammoth vein of gas and oil far superior to that of either of the two others developed in this locality. The strength of the gas threw the oil above the derrick to a height of 30 feet. The flow of oil gradually diminished, and by 6 o'clock p. m. nothing but gas and salt water was coming from the well. It is a better well than any other in the Greenfield district. The well is owned by an Indianapolis syndicate of ten persons including E. B. Martindale and Colonel Gray. The syndicate will organize into a company and at once develop further the field in which it already has two good wells. Greenfield is in Hancock county, and about 20 miles east of Indianapolis. The flow of oil exhausted itself the first day.

Natural Gas For Indianapolis.

The gas question at Indianapolis is not yet settled. The Anderson Natural Gas Company made a great fuss and promised to pipe the city at once if a certain number of contracts were signed by a certain time. After canvassing the city for several weeks, it made an unsatisfactory statement, returned the contracts, and withdrew from the field. The company claimed that its six gas wells at Anderson, had a total yield of 47,000,000 cubic feet of gas every 24 hours, and that its wells were superior in volume to any of the wells yet drilled at Kokomo, Muncie, Marion or Noblesville.

The Indianapolis Natural Gas Company is again moving ahead in the matter, and proposes under a modification of the present ordinances, to get gas into the city by January 1. The Indianapolis *News* says;

The facts seem to warrant the statement that the Indianapolis company has not acted more promptly simply because it had not gas enough. The Harris well gave great promise, but no large wells have been found until quite recently. To obviate this source of delay negotiations were entered into, as intimated in the *News* at the time, with the Guffey syndicate, which owned one great well, a small one or two, and considerable gas territory widely scattered throughout the Hamilton county fields. There was little or no difference between the Guffey people and the Indianapolis company when the Doxey scheme was sprung. This, it is alleged, interfered with the negotiations. Now they have been resumed. If consolidations now under consideration, which involve other interests than the two here mentioned, are brought to a successful close, the Indianapolis company will have, it is asserted, at its disposal, between 75,000,000 and 100,000,000 cubic feet of gas daily and an unlimited territory yet to be developed.

A Deep Well in Massachusetts.

A firm of silk manufacturers at Northampton, Mass., about two years ago began sinking an artesian well there. It has now reached a depth of 3440 feet. All but 200 feet of the boring has been through sandstone. When the sandstone was reached it was thought that at a depth of 750 feet that would be the last of it, but when this depth had been attained and the sandstone still continued it was then predicted that by the time the drill had gone down 1250 feet it would be through the stratum, but not so; and again another prediction was in order, and 1500 feet was the depth named. But now the best geologists are at a loss what to say, for the question how far the sandstone does extend is a conundrum which they "give up." Prof. Emerson, of Amherst College and other eminent geologists, declare that it is impossible to tell anything about it. Mr. Haskell, the solicitor of the North American Mining Company, which is sinking the well, has brought the matter before the geologists of the Boston School of Technology, and they do not attempt to give any theory which affords any encouragement as to how far it will probably be necessary to go down before getting through with the sandstone. The theory is that the sandstone is the deposit of a vast river current in the past ages, and therefore it is difficult to arrive at any conclusion as to what the depth of this deposit may be. The well is now the deepest in the country, and with one or two exceptions, the deepest in the world.—*Northampton Herald*.

Indiana Gas Notes.

The sixteenth gas well in the Noblesville district was completed September 21.

The Carthage Natural Gas Company, of Carthage, Rush county, with a capital stock of \$10,000, was incorporated September 20.

A vein or "pot" of gas was struck on the farm of Jas. DeWolfe, 12 miles northeast of Laporte, Ind., October 12, at a depth of 150 feet. The gas blazed to a height of 6 feet above the pipe. Drilling will be continued.

The Broad Ripple Natural Gas Company has decided to lay a pipe line to Indianapolis immediately, and expects to supply a portion of the city this fall. More pipe is being purchased and additional wells will be sunk.

The citizens of North Indianapolis have organized a company to bore for natural gas. The capital stock is \$5,000, and the directors are Isaac Craft, Patrick Ward and James R. Hamilton. The company will drill a well near Crown Hill.

The third gas well at Greenfield was completed September 23. It is the property of the Indianapolis Natural Gas Company. The other two wells are owned by local companies, and both are bent on finding an outlet for their supply in Indianapolis.

A good gasser was struck at Greentown, 9 miles east of Kokomo, September 22. The Trenton was found at 937 feet and penetrated to a depth of 28 feet. The estimated capacity of the well is about 8,000,000 feet a day. It materially enlarges the extent of the Kokomo gas field.

Peru, Ind., has expended \$6000 and drilled 4 wells in the search after natural gas. The last failure was completed October 8, at a depth of 1040 feet, when an abundant supply of salt water was encountered. The record of the well is as follows:

Clay.....	200
Gravel.....	118
Limestone.....	200
Slate.....	487
Trenton Rock.....	35
Total	1040

The Capital City Gas Company, of Indianapolis, gave an exhibition of the power of its gasser on the Kimberlin farm, within 11 miles of Indianapolis, on the 17th of last month, which was highly satisfactory to all concerned. The well is located in the northeastern part of Marion county, and is nearer the city than any successful well yet drilled. This company has three wells, with a capacity of 8,000,000 cubic feet per day, and will lay mains to Lawrence and Brightwood before attempting to supply Indianapolis.

The eighth gas well at Kokomo was completed Tuesday, October 11. The *Dispatch* gives the following account of the well:

At 3 o'clock Tuesday afternoon the Tate well, No. 8, received her finishing touch and was turned over to the Kokomo Natural Gas Company. In point of flow she is estimated at about 5,000,000 cubic feet per day, making her third in the Kokomo field. Trenton rock was reached at 904 feet and the gas-bearing sand was penetrated to the depth of 23½ feet, making the exact measurement 927½ feet.

The citizens of Broad Ripple, Marion county, becoming dissatisfied with the rates proposed by the Broad Ripple Natural Gas Company, organized a company with \$10 shares, to drill a well close to the town. The town will afford less than 100 consumers. The old company

has already purchased pipe and commenced a line from the Dawson well. The rates to consumers are: Cook stoves, \$1.50 per month or \$15 per annum; heaters for large rooms, \$1.50 per month; for bed-rooms, 50 cents; for business rooms, \$2; hotel stoves, \$2.50. This company controls 7000 acres of land, and already have gas enough to supply several towns the size of Broad Ripple. On October 5, Omer Boardman lighted the first fire of natural gas in Marion county. The fourth well was started October 8.

THE Jefferson & Indiana Natural Gas Company, with head offices at Pittsburgh, has given notice of an application for a charter. This company is composed of J. M. Gaffey, William Shoyer, Thomas Hackett, Thomas Floyd, G. B. Hill, J. D. Scully, H. P. Ford, W. W. Wilson and W. H. Barclay. They leased about 30,000 acres of land in Jefferson and Indiana counties over a year ago, believing that a gas belt runs through the property. Now it is proposed to sink a number of wells as soon as the charter is granted and experiment all over the field.

THE Baden Natural Gas Company has been sold to a syndicate of Philadelphia capitalists. The property consists of 5000 acres of territory, 16 producing gas wells and 150 miles of line. The mains connect the wells with the towns of Sewickley, Bellevue, Dixmont, Glenfield, Agnew, Haysville, Osborn, Leetsdale, Baden, Freedom, Beaver, Bridgewater, Rochester and Allegheny City. The amount paid for the property is about \$500,000. Several wells are now being drilled by this company in the Economy and Sheffield districts.

MR. E. C. MERRILL, of 41 Taggart street, Allegheny, has completed his contracts with the Home Natural Gas Company of Brownsville, Pa., and established the firm of E. C. Merrill & Co. at Pittsburgh, for the conduct of the business of natural gas engineering. The firm is a competent one and is prepared to furnish plans and estimates for natural gas lines upon application. His pressure regulators for street mains, factories and dwellings are in universal demand, and are strongly recommended by the Wheeling Natural Gas Co.

The "Highflyer," a German ship having on board 5885 barrels of petroleum, was recently burned on the high seas.

SUMMARY of the Statement of the Tidewater Pipe Company, Limited, for September, 1887:

Quantity of crude petroleum in custody at beginning of September.....	Barrels. 1,545,709.89
Quantity of crude petroleum at close of Sept. 1, 1887.....	1,706,206.94
Less sediment and surplus.....	170,869.65
Receipts during September.....	1,535,337.29
Received in iron tanks.....	165,195.06
Deliveries during September—to refiners.....	43,004.73
Deliveries during September—to other parties.....	216,961.79
Outstanding certificates, accepted orders, etc.....	216,961.79
Credit balances.....	725,000.00
	810,337.29
Total liabilities, September 30, 1887.....	1,535,337.29

AUGUST SUMMARY.

Quantity of crude petroleum in custody at beginning of August.....	Barrels. 1,536,760.74
Quantity of crude petroleum at close of Aug. 1, 1887.....	1,722,303.11
Less sediment and surplus.....	176,593.22
Receipts during August.....	1,545,709.89
Received in iron tanks.....	165,007.25
Deliveries during August—to refiners.....	47,703.61
Deliveries during August—to other parties.....	204,275.15
Outstanding certificates, accepted orders, etc.....	204,275.15
Credit balances.....	910,000.00
	635,709.89
Total liabilities August 31, 1887.....	1,545,709.89

The Refined Market.

A fairly good business was done in refined in September, at an advanced price, although buyers were slow about giving orders until after the flurry in the crude market was over. The quotation for 70 degree Abel test was marked up to 6½c early in the month, and on the 10th it advanced to 6¾c, and on the 12th to 6¾c. It quickly returned to the 6½c point on the 15th, and staid there for the remainder of the month. The foreign markets also showed a stronger feeling; freight rates have ruled lower, and the supply of freight room has been more than equal to the demand.

The exports of refined, crude and naphtha, from all ports, from January 1 to October 1 have been as follows:

	1887. Gallons.	1886. Gallons.
From Boston.....	3,277,547	4,091,492
Phi adelphia.....	122,384,453	112,706,856
Baltimore.....	6,496,152	12,581,444
Perth Amboy.....	12,556,908	3,998,017
Total.....	144,715,060	133,377,809
From New York.....	280,124,231	296,838,339

Total exports from United States...424,839,291 430,216,148

Refined for the home trade shows increased demand with prices as follow: 8¼@8¾c for New York State legal test, 7@7¼c for 110° test, 7¼@7¾ for 120° test, 7½@7¾c for New York city 110° flash, and 8½@8¾c for New York city 150° water white. Western lots are offered at 6¾@7c for 110° test Standard white, 7@7¼c for 120° test Standard white, 7½@7¾c for 130° test Standard white, and 8¼@8½c for 150° test water white. Western naphtha 68° to 72° test is quoted at 7½@8c delivered in New York.

William H. Samuel & Co., of Liverpool, England, report the visible supply of refined petroleum on September 1st as follows:

	Barrels.
Europe (7 Continental ports).....	1,599,037
London.....	205,105
Liverpool.....	118,000

Total.....1,922,142

The same parties say: "The tendency of prices during the past few weeks has been decidedly upward, notwithstanding the increased actual and prospective importations of Russian oil.

There does not appear to have been any reason for this activity in the market for certificates other than the falling off in production. This may suit speculative movements, but it is not of really important moment, as it is well known that production is artificially kept down to enable prices to be maintained on a remunerative basis, and present large stocks to be reduced.

As might be expected in face of an excited market for crude, American refined oil has exhibited an upward tendency, and now stands at the equivalent of ¼d. per gallon above the lowest point touched this season. There is this difference however between the crude and refined oil markets, that whereas the former has been subject to violent fluctuations, the latter, as far as the favorite brands are concerned, has all along substantially maintained the improvement made last month.

The future course of prices in our market is, we think, more dependent at present upon local influences than upon the primary markets. The general anxiety of importers to sell has kept our market in a somewhat depressed state since the opening of the season, and the improvement of the past few weeks can hardly be said to have entirely drawn the market from its depressed condition. Its present firmness, however, maintained steadily as it now has been for some time, points to a still greater improvement as the season advances, and bearing in mind the fact that prices last season were

maintained for nearly four months at an advance of 1d. per gallon, there would appear to be much stronger probability of higher prices than the contrary."

Refined in cases is in increased demand. The price for plain tops has been advanced to 8½c per gallon. The clearances for September in this class of goods to China and the East amounts to 920,821 cases, an increase of 637,070 cases over the same month in 1886. The total clearances to September 30, 1887, are 8,382,188 cases, a decrease of 1,164,398 cases, as compared with the corresponding period of the year preceding.

Mr. George H. Lincoln's monthly circular gives the following figures on the clearances of refined petroleum, in cases, for China and the East up to the 30th of September for the years 1886 and 1887:

	1887. Cases.	1886. Cases.
China.....	1,408,962	2,359,507
Japan.....	2,192,645	1,186,804
India.....	2,426,600	3,016,042
Java, Singapore, etc.....	2,353,981	2,984,233
Total August 31st.....	8,382,188	9,546,585
Total September 30th.....	7,461,367	9,262,835
Clearances for September.....	920,821	283,751
Clearances for August.....	1,006,761	549,916
Clearances for July.....	852,078	1,028,427
Clearances for June.....	1,084,921	1,471,362
Clearances for May.....	949,574	1,112,522
Clearances for April.....	1,085,363	742,478
Clearances for March.....	1,157,823	2,058,609
Clearances for February.....	733,626	1,281,488
Clearances for January.....	591,221	1,018,033
Total.....	8,382,188	9,546,586

REFINED QUOTATIONS FOR SEPTEMBER.

	New York.....	Philadelphia.....	Baltimore.....	London and Liverpool.....	Bremen.....	Antwerp.....
	Cts.	Cts.	Cts.	Pence.	Marks.	Francs.
1.....	6½	6½	6½	5½	6.00	15¼
2.....	6½	6½	6½	5½	6.00	15½
3.....	6½	6½	6½	5½	6.00	15½
4.....	6½	6½	6½	5½	6.00	15½
5.....	6½	6½	6½	5½	6.05	15½
6.....	6½	6½	6½	5½	6.05	15½
7.....	6½	6½	6½	5½	6.05	15½
8.....	6½	6½	6½	5½	6.05	15½
9.....	6½	6½	6½	5½	6.05	15½
10.....	6½	6½	6½	5½	6.05	15½
11.....	6½	6½	6½	5½	6.05	15½
12.....	6½	6½	6½	5½	6.20	15½
13.....	6½	6½	6½	5½	6.25	15½
14.....	6½	6½	6½	5½	6.20	15½
15.....	6½	6½	6½	5½	6.20	15½
16.....	6½	6½	6½	5½	6.20	15½
17.....	6½	6½	6½	5½	6.20	15½
18.....	6½	6½	6½	5½	6.20	15½
19.....	6½	6½	6½	5½	6.20	15½
20.....	6½	6½	6½	5½	6.20	15½
21.....	6½	6½	6½	5½	6.20	15½
22.....	6½	6½	6½	5½	6.20	15½
23.....	6½	6½	6½	5½	6.20	15½
24.....	6½	6½	6½	5½	6.20	15½
25.....	6½	6½	6½	5½	6.20	15½
26.....	6½	6½	6½	5½	6.20	15½
27.....	6½	6½	6½	5½	6.20	15½
28.....	6½	6½	6½	5½	6.20	15½
29.....	6½	6½	6½	5½	6.15	15½
30.....	6½	6½	6½	5½	6.15	15½

GEORGE WESTINGHOUSE, Jr., President of the Philadelphia Company, recently purchased lands aggregating 950 acres between Brinton and Walls station, Allegheny county, at a cost of about \$500,000. It is principally level meadow land.

THE Mahoning Gas Company completed another good gasser near Punxsutawney October 7.

OVER 100 companies have been formed to search for natural gas and oil in Kansas. James C. Tennent and James Briody are taking contracts to drill deep wells at various points in the State.

THE test well at Ithaca, N. Y., has struck a vein of rock salt 40 feet thick. It was 2230 feet deep October 8, and will probably be sunk another thousand feet.

September Production Report.

Reports of stocks at wells received by THE PETROLEUM AGE show an average decrease of 3.8 barrels to the well in the Bradford and an increase of 1.1 barrels to the well in the Allegany field during the month of September. The total number of wells connected with the pipe lines October 1st was estimated at 14,100 in the Bradford and 4007 in the Allegany field. Taking the above figures as the basis of an estimate on the daily production, stocks in tanks at wells were decreased at the rate of 1539 barrels a day in the Bradford and Allegany fields. The total daily runs in both fields averaged 25,655 barrels a day in September. Subtracting the reduction in stocks, the Bradford and Allegany production averaged 24,116 barrels a day in September, which may be placed at 3,300 barrels a day for the Allegany and 20,816 barrels a day for the Bradford field.

THE AUGUST REPORT.

Stocks at wells showed an average decrease of 2.0 barrels to the well in the Bradford and of 1.1 barrels to the well in the Allegany field during the month of August. Taking the above figures as the basis of an estimate on the daily production, stocks in tanks at wells were decreased at the rate of 1052 barrels a day in the Bradford and Allegany fields. The total daily runs in both fields averaged 26,447 barrels a day in August. Subtracting the reduction in stocks, the Bradford and Allegany production averaged 25,395 barrels a day in August, which may be placed at 3895 barrels a day for the Allegany and 21,500 barrels a day for the Bradford field.

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

Field.	No. Wells Sept. 1.	No. Wells Oct. 1.	Average per well Sept. 1.	Average per well Oct. 1.
Clarendon and Tiona	106	91	21	23
Cherry Grove	22	22	35	33
Cooper District	130	130	33	31
Lower Country	218	221	82	80
Miscellaneous	223	225	66	64

Accepting the outside runs, which are made up of the producing fields outside of Bradford and Allegany, as representing the production outside of those two fields, an estimate on the yield for September and August is as follows:

Field.	Sept'm'r. Barrels.	August. Barrels.
Bradford	20,806	21,500
Allegany	3,300	3,895
Outside Runs	36,029	33,726
Total	60,145	59,121
Macksburg	770	900
Total with Macksburg	60,915	60,021
Increase per diem	894	...

This represents a decrease in production of 18,083 barrels per day when compared with the figures for September, 1886.

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region, with the exception of Bradford. The Lima runs by the Buckeye Pipe Lines were 15,525 barrels a day in September, 15,834 barrels a day in August, 12,580 barrels a day in July, 15,818 barrels in June, 14,486 barrels in May, 11,760 barrels in April, 9777 barrels in March, 7394 barrels in February, and 4226 barrels in January.

The following table shows the comparative production

for 1884, 1885, 1886 and 1887:

	Bradford.		Allegany.		Outside Runs.		Total	Prod.
	1885.	1884.	1885.	1884.	1885.	1884.	1885.	1884.
January	28,675	31,806	8,260	11,264	18,594	16,140	55,529	59,240
February	27,051	32,378	7,196	11,607	19,800	18,561	54,017	62,546
March	26,444	31,912	7,342	11,768	19,923	19,764	53,709	63,444
April	27,413	32,442	7,169	11,848	23,067	19,162	57,649	63,452
May	27,231	33,922	7,049	11,547	21,225	19,549	55,505	65,018
June	29,272	33,753	7,463	11,108	21,559	19,977	58,294	64,838
July	30,309	34,031	7,139	11,218	19,273	20,870	56,721	66,119
August	29,858	33,353	7,065	10,384	18,608	22,830	55,531	65,567
September	30,205	32,976	7,186	9,877	21,269	22,514	58,660	65,367
October	30,180	31,753	6,747	9,356	23,161	22,762	60,088	63,876
November	31,355	31,789	7,002	8,642	23,087	23,557	61,444	63,988
December	29,223	29,416	6,196	8,193	24,184	22,918	59,603	60,297
1886.	1885.	1886.	1885.	1886.	1885.	1886.	1885.	1886.
January	28,677	28,675	6,378	8,260	22,217	18,594	57,272	55,529
February	28,584	27,051	6,651	7,196	22,603	19,800	57,840	54,047
March	27,947	26,444	6,137	7,342	25,680	19,923	58,764	53,709
April	27,807	27,413	6,527	7,169	28,693	23,067	63,027	57,649
May	27,148	27,231	6,535	7,049	34,515	21,225	68,198	55,505
June	27,860	29,272	6,554	7,463	40,040	21,559	74,454	58,294
July	27,046	30,309	6,350	7,139	40,491	19,273	73,887	56,721
August	26,695	29,858	6,200	7,065	43,762	22,830	76,657	55,531
September	26,674	30,205	5,994	7,186	45,560	21,269	78,228	58,660
October	25,454	30,180	6,017	6,747	45,538	23,161	77,009	60,088
November	24,503	31,355	5,860	7,002	40,817	23,087	71,180	61,444
December	22,422	29,223	5,178	6,196	38,783	24,184	66,383	59,603
1887.	1886.	1887.	1886.	1887.	1886.	1887.	1886.	1887.
January	23,269	28,677	5,563	6,378	34,254	22,217	63,086	57,272
February	22,930	28,586	5,049	6,651	35,745	22,603	63,724	57,840
March	22,327	27,947	4,937	6,137	36,135	25,680	63,392	59,764
April	21,880	27,807	4,447	6,137	37,120	28,693	63,447	63,027
May	21,995	27,148	4,500	6,535	36,758	34,515	63,253	68,198
June	22,000	27,860	4,337	6,554	35,938	40,040	62,275	74,454
July	21,500	27,046	4,000	6,350	34,505	40,491	60,005	73,887
August	21,500	26,695	3,995	6,200	33,726	43,762	59,121	76,657
September	20,816	26,674	3,300	5,994	36,029	45,560	60,145	78,228

The Reibold Gauges.

On the 15th of October there were 92 wells in the Reibold field producing 8049 barrels a day. Of the entire number Mr. T. W. Phillips is interested in 57 with a daily output of 7145 barrels. On the 7th of October there were 89 wells in this field with a yield of 7,660 barrels. The 24 hours gauge of the heaviest wells are shown in the following:

Farm.	Owner.	Pro'n. Sep 10.	Pro'n Sep 24.	Pro'n. Oct 1.	Pro'n. Oct 7.	Pro'n. Oct 15.
Z Markje, Phillips	No. 2	255	239	840	510	389
A H Behm,	No. 5	2,160	1,404	1,392	888	672
"	No. 6	131	2,160	1,689	1,680	1,512
G R Behm,	No. 5	...	...	...	...	1,390
St hm,	No. 3	52	30	1,260	1,800	1,224

Comparative Statement.

STATISTICAL SUMMARY OF THE PETROLEUM SITUATION.

	1887. Sep'm'r.	1886. Sep'm'r.
Wells completed	130	253
New production	2,094	13,540
Dry holes	34	36
New rigs	56	121
Old rigs	106	138
Drilling wells	121	322
Total field operations	283	581
Average daily pipe line runs	61,428	77,989
Average daily shipments	71,930	69,932
Total stocks custody pipe lines	39,964,779	33,637,546

THE MARKET.

	1887.	1886.
Refined in New York	6½	6¼
Opening price of crude for the month	64½	61½
Highest price of crude for the month	75½	66
Lowest price of crude for the month	61½	61¼
Closing price of crude for the month	68½	62½
Average price of crude for the month	67	63½

THE Northwestern Pennsylvania Natural Gas Company on October 1st shut down in supplying natural gas for pumping oil wells, and consumers at Oil City were notified as follows:

On and after October 1st, 1887, the following rates will be charged for gas furnished by this company:

½ Meter Cook Stove	\$2 00
½ Meter Heating Stove	3 00

Additional rates will be furnished consumers by applying to the office of the company.

NORTHWESTERN PA. NATURAL GAS CO.

NATURAL gas has been discovered at Herndon, Guthrie county, Iowa, which is the only place in that State where it is known to exist in considerable quantities. The remarkable thing about the discovery is that the gas pours forth without visible diminution in volume, from wells only 120 to 165 feet in depth.

SEPTEMBER OPERATIONS.

THE ENTIRE REGION—WELLS COMPLETED, WELLS DRILLING, AND RIGS UP AND BUILDING.

WELLS COMPLETED IN SEPT., 1887.

Allegany Field.

Twp.	Owner.	Barrels
Wirt, 25,	Empire Gas Co. (for gas)	gas
" 47,	Glenn Oil Co.	5
" 44,	Allegany Gas Co. (for gas)	gas
Clarasville, 3,	National Transit Co No 89.	5
" 10,	Angell Oil Co.	7
" 3,	(Smith) Fritz & McKelvy No 2	5
Wells completed		6
Production		22
Dry		2

Bradford Field.

East and West Branches.

Kendall Creek.

Melvin, P C L & P Co No 109	16
" " " No 110	10
" " " No 111	10
" " " No 112	12

Knapps Creek.

Sprague, W. Sprague No 1	3
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Foster Brook.

E. Co, Kervin & Co No 10	6
C B & H, Clark, Cooper & Co No 9	6
" " Watson Oil Co No 52	5

Four Mile.

Stevens, Stevens Bros No 3	6
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Cole Creek.

Bingham, C P Byron No 14	10
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Kinzua Village.

Lot 123, Newell & Quigley No 4	6
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Miscellaneous—Port Allegany.

Arnold, Dolley & Co. (for gas)	dry
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Wells completed	13
Production	87
Dry	1

Warren and Forest.

GLADE AND OTHER TOWNS.

Kinzua Village.

Hodge, Morse estate No 3	dry
" " " No 8	125
Weed, " " McCalmont Oil Co	No 12 30
" " " McCalmont Oil Co	No 13 5
Wells completed	4
Production	160
Dry	1

Clarendon.

35, Henderson & Murphy	5
52, Citizens Gas Co	gas
105, Hackett & Shirley	5
532, C A & D Cornen No 4	6

Wells completed	4
Production	16
Dry	1

Tiona.

103, J L McKinney & Co.	5
201, Wesley Chambers No 7	6
206, John J Carter	6

Wells completed	3
Production	17

Balltown.

Dusenberry, J C Welsh	10
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Wells completed	1
Production	10

Grand Valley.

Huidekooper, L B Wood & Co	3
Phil lands, Crippens & Phillips No 6	dry
Reeves, National Oil Co No 4	3
" " " No 5	5
White, M Stewart & Co No 3	4
Lot 346, (Reno pur) A W Parker	4
Knapps, L B Wood & Co	dry
Blakeley, C W Scofield No 11	5
Lot 150, Ne son Farr No 15	6

Wells completed	9
Production	30
Dry	2

Miscellaneous—Elk Co., Etc.

2027, J Stettheimer	6
2033, Highland Oil Co No 4	10
2033, Porter, Thyng & Co No 8	10
Ludlow, Pennsylvania Gas Co	gas
2684, (McKean) National Transit Co No 31 gas	
2685, " " " No 33 gas	

Harmony Township, Forest County.

Joslyn, Wood & Stewart No 2	dry
McNutt, Boyce & Duck No 1	2
Johnson Run, S S Stewart & Son	dry
Hickory, John J Carter	dry
Munross, " " No A	8
" " " No B	10

Wells completed	12
Production	46
Dry	6

Lower Country.

Venango and Other Sections.

Farm.	Operator.	Barrels.
McKinley, B aunschweiger No 2		10
Ross, B F Brndred No 6		10
Columbia, Columbia Oil Co No 176		10
Buchanan, J H McCandless No 10		10
McClintock, McComb Bros		10
Reno, Reno Oil Co		3
Pioneer, (Keech) J Stillwagon		dry
Raym lton, (Raymond) W Raymond		3
" (Adams) Glenn & Co		4
Barrett, Longwell & Co		5
Pin Oak, (Dale) A P Dale		4

Vicinity Pleasantville.

Talman, W P Black No 7	15
" " " No 8	10
Dailey, " " No 4	15
" " " "	dry
Atkinson, Culp & Stewart No 2	5
Water Sedoras, Shamburg & Watson	dry
Cherry Run O Co tract, Chas. Everett	dry
Lytle, Miller & Crippens	dry

Tipperary, Hall's Run, Etc.

Humboldt, Taylor, Torrey & Murphy	No 2 8
" " " " No 3	8
" " " " No 2	2
M Fox, Wesley Chambers No 2	5
McCalmont, E Cr wford & Co No 1	5
Phil & Bost, Porterfield, Crawford & Co	No 1 10
" " " " No 2	10
" " " " No 2	10
Gates & Doty No 2	10
Wickersham, Guchert & Co (Wood No 3)	No 2 20
Plumer farm, Loots & Co	dry
School House Lot, Richie & Deol	3
Tarkill, (A Hill) Taylor, Torrey & Murphy	gas
" " " " Fisher & Judd	gas

Mt. Hope and Smoky District.

Miller, Galbraith & Co No 4	3
Brandon, Sheasley & Galbraith No 2	60
Steeffe, Sheasley & Galbraith No 1	dry

Vicinity Emlenton.

J M Black, J M Black & Son	3
R S Grant, Edwards & Co	10
Hayes, James Bennett	6
R Anderson, Redick & Anderson	8
Murrensville, Bastaff & Saliday	dry

Bullion.

Plumer, Hoffman & Co	dry
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Wells completed	40
Production	280
Dry	11

Clarion.

Shippen, John J Carter No 10	15
" " " No 11	10
Egypt, Hess & Eggers	2
Cotterman, Kerstetter & Co	6

Wells completed	4
Production	33
Dry	0

Butler and Armstrong.

Peiffer, Phillips & Osborne No 2	10
" " " No 1	dry
McCalmont, " " No 14	dry
J Dickey, Fisher Oil Co No 2	20
Blakeley, Coast & Co No 2	30
" " " Root & Johnson No 4	15
" " " " No 5	275
Saxonsburg, (Welch) Haymaker & Co	dry
" " " Lonetz, Bollard, Greenlee & Co	40
Zinkhorn, Gibson, Gahagan & Co No 1	dry
Miller Eddy, Joseph Thomas & Co	dry
McElwee, Dennison & Fiegle	gas
McCulcugh, Morrison & Albert	5
Parker, (Redick farm) Columbia Oil Co	No 8 3
Joseph Knox, Devitt & Co	12
Duffey, Rock Oil Co	10
Widow McElwee, Burns, McMarlin & Co	No 2 dry
Jacob Smith, James Redd, No 1	dry
Sweeney, C Wolford & Co	5
Walley, Turner, Sutton & Co	dry
Widow Campbell, Hogue & Co	5

St. Joe.

Shultz, Shultz & Co	3
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Thorn Creek.

McLaughlin, Thorn Oil Co	10
N Mangell, N Mangell	15

Wells completed	24
Production	458
Dry	9

Washington.

Martin heirs, John McKeown No 8	260
" " " " No 9	25
Davis, Davis Bros No 1	50
Muncie, I W llets No 27	25

Taylorstown.

Carrothers, West Virginia Natural Gas	Co No 1 80
Dinsmore, " " " "	dry
Robert Noble, " " " " No 1	135
Buchanan, R H Thayer & Co	20
Cundall, Anchor Oil Co No 2	220
" " " " No 3	120
Wells completed	10
Production	935
Dry	1

DRILLING WELLS.

RIGS UP AND BUILDING SEPTEMBER

30, 1887.

Allegheny Field.

Scio.

Lot.	Owner.	Depth.
3,	Coyle & Simon (old)	rig
12,	Allen & Morse (old)	rig
12,	Griffin & Co No 10 (old)	rig
50,	Pease & Coyle No 9 (old)	rig
46,	L. G. Norton No 4 (old)	rig
New rigs.....		0
Old rigs.....		5
Drilling.....		0
Total.....		5

Alma.

4,	Breckenridge & Co	drilling
3,	M J McMullan & Co No 5 (old)	rig
23,	Vance & Hor on (old)	rig
26,	Willets & Elliott (old)	rig
51,	Sawyer & Co (old)	rig
120,	McCalmont Oil Co No 10 (old)	rig
New rigs.....		0
Old rigs.....		5
Drilling.....		1
Total.....		6

Wirt.

44,	Allegheny Gas Co (for gas)	rig
61,	(Devo) Empire Gas Co (for gas)	drilling
55,	P M Shannon & Co (old)	rig
52,	(Jacob Jordan) Wilson & Johnston No 9 (old)	rig
61,	(J Jordan) Ackerly, Barton & Co (old)	rig
61,	(Isaiah Jordan) Lester, Jordan & Co No 6 (old)	rig
61,	" " No 7 (old)	rig
62,	(Peterson) Limekiln Club No 4 (old)	rig
62,	(Latham) " No 1 (old)	rig
New rigs.....		1
Old rigs.....		7
Drilling.....		1
Total.....		9

Bolivar.

12,	Wood & Co (old)	rig
23,	F C Streeter & Co No 12 (old)	rig
New rigs.....		0
Old rigs.....		2
Drilling.....		0
Total.....		2

Genesee.

14,	Merwin (old)	rig
22,	I Willets No 14 (old)	rig
22,	" " No 15 (old)	rig
22,	" " No 16 (old)	rig
22,	" " No 17 (old)	rig
22,	" " No 18 (old)	rig
23,	Coughlin (old)	rig
29,	William Cranston (old)	rig
8,	I Willets (shut down)	50
New rigs.....		0
Old rigs and shut down.....		9
Drilling.....		0
Total.....		9

Clarksville.

2,	National Transit Co No 90 (for gas)	drilling
3,	Angell Oil Co	rig bldg
5,	Lane, Lane Oil Co No 7 (old)	rig
6,	(Seever) Ackerly, Barton & Co No 9 (old)	rig
9,	Heuston & Brecht No 4 (old)	rig
9,	Merrit (old)	rig
5,	(Weatherbee) Barton & Ackerly (old)	500
New rigs.....		1
Old rigs.....		5
Drilling.....		1
Total.....		7

Bradford Field.

East and West Branches.

Clark, Clark & Owens (for gas).....	drilling
Mack, Columbia Oil Co (old).....	rig
Mack, Fisher Oil Co No 19 (old).....	rig
Paton, McClure & Co (old).....	rig
Clark, McCray Bros (old).....	rig
<i>Quintuple.</i>	
27, O H Strong (old).....	rig
44, J W Humphrey (old).....	rig
260, E T Howes (old).....	rig
New rigs.....	6
Old rigs and shut down.....	7
Drilling.....	1
Total.....	8

Knapp's Creek.

Matthews, C B Whitehead No 6 (old)	rig
Borden, T P Thompson (old).....	2 rigs
Rixford, Duke Centre Gas Co (for gas)....	drilling
G E Lis, Eldred Gas Co No 2 (for gas)	drilling
Mulvaney, Eldred Board of Trade (for gas)....	drilling
New rigs.....	0
Old rigs.....	3
Drilling.....	3
Total	6

Foster Brook.

E T Co, Kervin & Co No 10 (old).....	rig
C B & H, Juter & Yager (old).....	rig
“ Barnes & Mouroc (old).....	rig
“ Watson Oil Co No 52.....	drilling
“ “ No 53 (old).....	rig
<hr/>	
New rigs.....	0
Old rigs.....	4
Drilling.....	0
<hr/>	
Total	4

Four Mile.

Van Campen, Coldren & Vance (old)	rig
" Jas K Van Campen No 3	

Indian Creek.

Hawlin, M B Squiers No 4 (old).....	rigs
W & M, Dusenbury & Wheeler (old)	3 rigs
<hr/>	
New rigs.....	0
Old rigs.....	4
Drilling.....	4
<hr/>	
Total.....	4

Allen, Harrington & Co..... drilling

Cole Creek.

Warrant 2263, Union Oil Co No 6 (old)	rig
“ 2263, “ N. 7 (old)	rig
Bingham, lot 69, Bennett & Thompson No 11 (old)---	rig
“ lot 477, Tucker & Rolfe No 3 (old)---	rig
New rigs-----	0
Old rigs-----	4
Drilling-----	0
Total-----	4

Kinzua.

Guffy & Hulings, Union Oil Co No 73	(old)-----	rig
Lot 128, Newell & Quigley No 5	-----	rig
New rigs-----	1	
Old rigs-----	1	
Drilling-----	0	
Total-----	2	

Warren and Forest.

GLADE AND OTHER TOWNS.

Hodge, Morse estate	No 9.....	sand
“	“ No 10.....	rig
“	“ No 11.....	rig
White, “	No 13.....	sand
5546, Collins & Phillips		drilling
Sugar Grove, Sugar Grove Gas Co.		drilling
Weed, Morse & McCalmont Oil Co	No 14....	drilling
		<hr/>
New rigs.....		2
Old rigs.....		0
Drilling.....		5
		<hr/>
Total		7

Clarendon.

Stonehill, Nutting & Co.....	rig
105, Tucker & Co (old).....	rig
532, C A & D Cornen No 5.....	200
556, J A Waterhouse & Co No 25 old.....	rig
556, " " No 26 old.....	rig
556, " " No 27 old.....	rig
558, Goal Bros No 6 (old).....	rig
562, " " No 6 (old).....	rig
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New rigs.....	1
Old rigs.....	6
Drilling.....	1
<hr/>	
Total.....	8

Tiona.

284, Watson & Mitchell No 8 (old).....	rig
201, Wesley Chambers No 8.....	drilling
201, " " No 9.....	rig bldg
<hr/>	
New rigs.....	1
Old rigs.....	1
Drilling.....	1
<hr/>	
Total.....	3

Cooper District.

407, Shank & Stewart No 9 (old).....	rig
407, " " No 13 (old).....	rig
	<hr/>
New rigs.....	0
Old rigs.....	2
Drilling.....	0
	<hr/>
Total.....	2

Balltown.

3194. Porcupine Oil Co No 39 (old).....	rig
3195, (Crisman) N F Clark No 14(ol)d.....	rig
Dusenbury, Granden & Co.....	rig
<hr/>	
New rigs.....	1
Old rigs.....	2
Drilling.....	0
<hr/>	
Total.....	3

Kane.

343, (Looker) Ernout & Co No 3	drilling	
Kane, (Griffith lot) Blood & Co (for		
gas) fishing	1800	
344, Treat & Mallory No 8 (old)	rig	
420, Coast & Sons No 24 (old)	rig	
3767, Union Oil Co (old)	rig	
Ryan, Man's Gas Co (for gas) No 3	drilling	
Welker, " "	No 4	drilling
<hr/>		
New rigs	0	
Old rigs	3	
Drilling	4	
<hr/>		
Total	7	

Grand Valley.

Whaley, Thos Cummings	drilling	
"	(old)	rig
Campbell, National Oil Co	No 18 (old)	rig
"	No 19 (old)	rig
"	No 20 (old)	rig
Hunter,	No 11 (old)	rig
"	No 12 (old)	rig
"	No 13 (old)	rig
Reeves,	No 3	drilling
Lot 150, Nelson Farrell No 16		rig
" 136, G P Kepler & Co (old)		rig
" 137,		rig
" 233, J B Jennings & Grandin (old)		rig
New rigs	1	
Old rigs	9	
Drilling	2	
Total	12	

Miscellaneous—Elk County, Etc.

1799, sub 2, Gill's Farm Oil Co., No 1 (shut down)	sand	
2032, Boggs, Rosenberg & Co No 4 (old)	rig	
2033, Clark & Foster No 8 (old)	rig	
3661, " No 5 (old)	rig	
2020, Andrews & Barnsdall No 2	drilling	
2020, " No 3	drilling	
2033, Highland Oil Co No 3	drilling	
2027, Mike S lk & Co No 1	drilling	
Buck Run, Wilcox Tannery Co	drilling	
2686, Armstrong & Co (old)	rig	
Crawford, Sill & O'Dell No 2	sand	
2533, Millstone twp, Welsh & Wallace	drilling	
Millstone twp, Johnson O'Dell & Co	drilling	
Proper, (near Tionesta) J Wolcott & Co	drilling	
Ludlow, Pennsylvania Gas Co	drilling	
2684, (McKean) National Transit Co		
" No 32	rig	
2695, " No 34	rig	
5508, (Forest) Collins Oil Co	rig	
Freeman's Station, Knox Bros (shut down)	2000	

Harmony Township, Forest County.

Bromley, Wood & Stewart No 1	rig	
Munross, John J Carter No C	drilling	
" No D	rig	
Fogel, " No E	sand	
" No F	drilling	
Copeland, " No G	drilling	
Connelly, Black Bros	rig bldg	
New rigs	6	
Old rigs	6	
Drilling	15	
Total	27	

Lower Country.

Venango and Other Sections.

Ross, B F Brundred No 7	rig	
McKinley, M Braunschweiger No 3	drilling	
" Haines & Co	drilling	
Osmer, Galbraith & Parker (old)	rig	
Rynd, Wratten & Co (old)	rig	
Niagara, Henry Wilbert	rig	
Geo Wratten, Curtis	rig	
Blood, P Bank-on	drilling	
Anderson, Trax & Simmons No 2	rig	
Petroleum Centre, Rhodes Bros	rig bldg	
Dalzell, W J McCray	rig	
Pioneer, (Benninghoff) Stewart & Culp	rig	
Pioneer, (Ind, R Oil Co) J C Chandler	rig	
Pithole, (Wood farm) Innis & Co	sand	
Cherry Tree, H Goehring & Co	rig	
Pin Oak, J B Smithman	rig	
Raymilton, (McClellan) Doyle	drilling	
" (Simcox) Simcox & Co	drilling	

Vicinity Pleasantville.

Landis, W P Black (old)	rig	
Tallman " No 9	drilling	
" " No 10	rig	
Matteson " "	drilling	
" Joy & Co	drilling	
Armstrong, Joy & Co No 1	rig	
Atkinson, Culp & Stewart No 3	sand	
" Wait Bros No 3	sand	

Fisher, Young & Locke No 5	drilling	
Herbert, Dr Shamburg	rig	
Weekley, R Foggins	drilling	
Mill, Ed Grav	rig	
Vesta Pebin Co, Bredin Bros	drilling	
Tarr, Wilhelm & Kearney	rig	
P Becker, H Miles	rig	
Farrell, Shelmadine & Durnham	drilling	

Tipperary, Hall's Run, Etc.

McCalmont, E Crawford & Co No 2	rig	
Phil & Bost, Porterfield, Kelley & Co No 3	drilling	
" Goodrich & Salisbury No 2	drilling	
Sleppy, Jndd & Geizer	rig	
Dale, Shafer & Dale	drilling	
Wickersham, Guehart & Co No 3	drilling	
Raisen, Warner & Co No 3	rig	
Keystone lands, Duffield & Co	rig	
Mays, Moriarity & Co No 2	drilling	
Mitchell, Mitchell & Steele	drilling	

Mt. Hope and Smoky District.

Carner, Carner & Co	sand	
Brandon, Sheasley & Galbraith No 3	rig	

Vicinity Emlenton.

Flynn, Flynn Bros	drilling	
" Henry & Williams	drilling	
Royal, J Thomas & Co	drilling	
Lagne, Girard & Co	drilling	
Thompson, Sherwood & Galbraith	drilling	

Bullion.

Crawford, McFadden & Co	drilling	
Atwell, Hovis & Co	drilling	
Murvin, Burns & Co	sand	
New rigs	21	
Old rigs and shut down	3	
Drilling	30	
Total	54	

Clarion.

Ossil, Kribbs & Co	200	
Wagner, Hahn & Wagner	fishing	
Rapp, Hahn & Son	rig	
Baker, John Irwin	200	
Fillman, J R Fillman	400	
John Henry, Koch Oil Co No 8 (old)	rig	
Lloyd, Dr Metzger (old)	rig	
Shreffler, McCallom & Co (old)	rig	
Wagner & Curl, J V Ritts (old)	rig	
Brown, J V Ritts (old)	rig	
Heasley, Heasley & Co (old)	rig	
Creswell, (Nineveh) Lee & Co	drilling	
Kossuth, Hulings Bros	drilling	
New rigs	1	
Old rigs	6	
Wells drilling	6	
Total	13	

Butler and Armstrong.

Chas Duffey, Hoch & Co (old)	rig	
Goehring, Phillips & Osborne No 1	1350	
Geo Behm, " No 5	1350	
A H Behm, " No 6	1100	
Thorn Hill, Munhall & Co	1450	
Blakeley, Coast & Co No 3	rig bldg	
" Root & Johnson No 6	200	
Stahm, Phillips & Osborne No 4	1100	
Markle, Phillips No 12	sand	
Galeaugh, Le decke Bros No 1	rig	
Snow, Gantz & Co	rig bldg	
Miller, Slagle & Co	1350	
C Rogers, G Fetzner	sand	
Coyle, M P Black & Co No 3	1400	
John Kelley, Edwards & Co	drilling	
Behm, Winkle Oil Co No 4	600	
Robt Gbson, Brown & Co	100	
Bish, Showalter Bros	500	
Bromfield, Vessel & Co	rig	
Jno Boyle, Rev Quilter	rig	
Critchlow, Steinbroch & Co	1350	
Winner, McGuire	sand	

Saxonsburg.

Adler, Bolard, Greenlee & Co No 1	250	
Wid Lonitz, " No 1	600	
Bathenfelder, " No 1	100	
Lonitz, " No 2	rig	
" " No 3	rig bldg	
" " No 4	rig bldg	
Grabe, R R Armor & Co	rig bldg	

Crawford, Haymaker & Co	300	
Pfaube, Golden & Co	100	
Adler, Urquhart, Lavens & Co	300	
" Troutman Oil Co	100	
" " "	rig bldg	
H Lonitz, Golden, Welker & Co	rig bldg	
Bauman heirs, Innmann & Co	rig	
Batenfelder, Extension Oil Co	100	
Seibert, John A Snelle & Co	200	

Thorn Creek.

Harbison, Connors & Flshel (old)	rig	
Harbison, Connors & Flshel	1400	
Bulford, C D Greenlee No 1	1600	
New rigs	11	
Old rigs	2	
Drilling	28	
Total	41	

Washington.

I Wilson, Forest Oil Co (old)	rig	
Mun e, John McKeown No 17	rig	
Ma'lin heirs, John McKeown	rig	
Coal Center, Hornbake (shut down)	1500	
Wiles, C O & Gas Co No 1	900	
McKeesport, Stone & Co	drilling	
Banc, Ten-Mile Oil Co (shut down)	1039	
Fergus, Chartiers Oil Co No 7	rig	
Bailey, McKennan Oil Co	900	
Nicholls, Willets & Son	2100	
West Belle Vernon, (for gas)	drilling	
California, J M Guffey (old)	rig	
Munce, I Willets & Son No 29	rig	
Davis, Davis Bros No 2	rig	
Paint lot, Harris & Co	1150	
Taylor, P L & H Co No 2	500	
Cameron, Willets & Young	rig	

Taylorstown.

Hutchinson, W Va Nat Gas Co No 1	750	
V Blaney, " No 1	50	
J McMannis, " No 2	400	
Neeley, " No 1	rig	
McLain, Iseman & Co No 1	2000	
Work, Ten Mile Oil Co	2300	
M ller, Campbell & Aiken	1400	
Sproul, Vandergrift & Reed	2000	
Carson, McLane & Co	700	
Martin, Kuntz, Todd & Co (old)	rig	
Taylor, Peoples L & H Co	500	
Carson, McLain & Co	500	
New rigs	8	
Old rigs and shut down	3	
Drilling	18	
Total	29	

Shannopin.

T Pinkerton, J S McKelvy (old)	rig	
Chas Eachel, Raccoon Oil Co No 4 (old)	rig	
Jno Morrow, Raccoon Oil Co No 4 (old)	rig	
Andrews, Philadelphia Co	drilling	
Gillfillan, " No 2	drilling	
Sodom, (Trumble) Manufacturers Nat Gas Co	drilling	

Greene County, Etc.

Fordyce, E M Hukill & Co No 1 (shut down)	1360	
Girard, E M Hukill & Co No 1	1060	
" " No 2	drilling	
Hathaway, E M Hukill & Co No 1 (fishing)	1060	
Mt Morr's, E M Hukill & Co No 1 (old) fishing	2250	
Longsnecker, E M Hukill & Co (old)	rig	
Ninevah, Johnson & Hamilton	2300	
Bristoria, Forest Oil Co	1300	
New rigs	0	
Old rigs and shut down	4	
Drilling	4	
Total	8	

FIELD OPERATIONS SUMMARIZED.

WELLS COMPLETED, WITH THE ESTIMATED PRODUCTION ON THE LAST DAY OF THE MONTH.

ALLEGANY FIELD.

Division of Field.	SEPTEMBER, 1887.			AUGUST, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Scio.....	0	0	0	0	0	0
Alma.....	0	0	0	0	0	0
Wirt.....	3	5	2	1	4	0
Bolivar.....	0	0	0	0	0	0
Clarksville.....	3	17	0	1	5	0
Genesee.....	0	0	0	1	5	0
Miscellaneous.....	0	0	0	0	0	0
Total.....	6	22	2	3	14	0

BRADFORD FIELD.

Division of Field.	SEPTEMBER, 1887.			AUGUST, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
E. and W. Branches.....	0	0	0	5	44	0
Kendall Creek.....	4	40	0	4	40	0
Foster Brook.....	3	17	0	0	0	0
Knapp's Creek.....	1	3	0	0	0	0
Four Mile.....	1	6	0	0	0	0
Indian & Meeks Creeks.....	1	5	0	1	8	0
Cole Creek.....	1	10	0	0	0	0
Kinzua.....	1	6	0	0	0	0
Miscellaneous.....	1	0	1	0	0	0
Total.....	13	87	1	10	92	0

WARREN AND FOREST.

District.	SEPTEMBER, 1887.			AUGUST, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Glade.....	4	160	1	10	275	5
Clarendon.....	4	16	1	5	25	0
Tiona.....	3	17	0	5	20	1
Cooper.....	0	0	0	0	0	0
Balltown.....	1	10	0	2	10	1
Kane.....	0	0	0	0	0	0
Grand Valley.....	9	30	2	17	80	3
Miscellaneous.....	12	46	6	6	30	2
Total.....	33	279	10	45	340	12

LOWER COUNTRY.

District.	SEPTEMBER, 1887.			AUGUST, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Venango.....	40	280	11	50	256	14
Clarion.....	4	33	0	8	41	4
Butler and Armstrong.....	24	458	9	19	934	5
Washington.....	10	935	1	15	5160	1
Shoustown, Etc.....	0	0	0	2	10	1
Total.....	78	1706	21	94	6401	25

GRAND SUMMARY.

District.	SEPTEMBER, 1887.			AUGUST, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Allegany.....	6	22	2	3	14	0
Bradford.....	13	87	1	10	92	0
Warren and Forest.....	33	279	10	45	340	12
Lower Field.....	78	1706	21	94	6401	25
Total september.....	130	2094	34	152	6847	37
Total August.....	152	6847	37			
Difference.....	22	4753	3			

Rigs Up and Building—Wells Drilling.

ALLEGANY FIELD.

Division of Field.	SEPTEMBER 30, 1887.				AUGUST 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Scio.....	0	5	0	5	0	4	1	5
Alma.....	0	5	1	6	0	5	0	5
Wirt.....	1	7	1	9	0	7	3	10
Bolivar.....	0	2	0	2	0	2	0	2
Genesee.....	0	2	0	2	0	2	1	3
Clarksville.....	1	5	1	7	2	6	1	9
Miscellaneous.....	0	0	0	0	0	0	0	0
Total.....	2	33	3	38	2	32	6	40

BRADFORD FIELD.

Division of Field.	SEPTEMBER 30, 1887.				AUGUST 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
E. and W. Branches.....	0	7	1	8	0	7	0	7
Kendall Creek.....	0	0	0	0	2	0	2	4
Knapp's Creek.....	0	3	3	6	0	3	1	4
Foster Brook.....	0	3	0	3	0	4	3	7
Four Mile.....	0	3	0	3	0	3	1	4
Indian Creek.....	0	4	0	4	3	1	1	5
Cole Creek.....	0	4	0	4	0	4	1	5
Kinzua.....	1	1	0	2	1	1	1	3
Miscellaneous.....	0	0	0	0	0	0	1	1
Total.....	1	26	4	31	6	28	11	45

WARREN AND FOREST.

Division of Field.	SEPTEMBER 30, 1887.				AUGUST 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Glade.....	2	0	5	7	3	0	3	6
Clarendon.....	1	0	1	2	4	1	3	8
Tiona.....	1	1	1	3	0	2	0	2
Cooper.....	0	0	0	0	0	2	0	2
Balltown.....	1	2	0	3	0	2	0	2
Kane.....	0	3	4	7	0	3	2	5
Grand Valley.....	1	9	2	12	2	11	3	16
Miscellaneous.....	6	6	15	27	5	2	11	18
Total.....	12	29	28	69	13	25	24	62

LOWER COUNTRY.

Division of Field.	SEPTEMBER 30, 1887.				AUGUST 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Venango.....	21	3	30	54	21	4	24	50
Clarion.....	1	6	6	13	1	6	6	13
Butler & Armstrong.....	11	28	41	80	4	3	34	41
Washington.....	2	2	18	22	1	4	21	26
Shoustown, Etc.....	0	4	4	8	1	4	6	11
Total.....	41	18	86	145	35	21	91	147

GRAND SUMMARY.

Field.	SEPTEMBER 30, 1887.				AUGUST 31, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Allegany.....	2	33	3	38	2	32	6	40
Bradford.....	1	26	4	31	6	23	11	40
Warren and Forest.....	12	29	28	69	13	25	24	62
Lower Country.....	41	18	86	145	35	21	91	147
Total.....	56	106	121	283	56	101	132	289
Total August 31.....	56	101	132	289				
Difference.....	0	5	11	6				

SUMMARY of the Statements of the National Transit Company for September and August:

	September.	August.
	Barrels.	Barrels.
Receipts from all sources.....	1,730,614.33	1,704,404.28
Deliveries.....	1,886,690.83	1,884,209.73
Gross stocks end of month.....	32,179,251.92	32,576,610.26
Sediment and surplus.....	3,849,549.52	4,086,058.47
Total liabilities end of month.....	28,329,702.40	28,490,551.79
Outstanding acceptances.....	20,959,036.33	21,030,036.33
Credit balances.....	7,340,666.07	7,460,515.46

The above "receipts from all sources" for September were made up as follows:

Runs from wells.....	1,181,663.42
Received from other lines.....	525,759.54
Received in iron tanks.....	23,191.42

Total.....1,730,614.38

The above "total deliveries" for September were made up as follows:

Regular shipments.....	1,843,686.10
Delivered to other lines.....	43,004.73

Total.....1,886,690.83

The above "receipts from all sources" for August were made up as follows:

Runs from wells.....	1,255,897.36
Received from other lines.....	448,506.92

Total.....1,704,404.28

The above "total deliveries" for August were made up as follows:

Regular shipments.....	1,836,506.12
Delivered to other lines.....	47,703.61

Total.....1,884,209.73

PERRYSVILLE, a little town about 8 miles back from Allegheny City, has found 8 or 9 small gassers of from 100 to 200 pounds pressure, and the Perrysville Natural Gas Company in addition to supplying the town with natural gas, will run a high pressure line to Allegheny and pipe as much of the city as their supply will warrant.

Stocks Abroad.

Reports of stocks in London, and the seven principal Continental ports, are summarized in the following statement:

STOCKS AFLOAT AND ASHORE.	Sept. 24, 1887.	Aug. 20, 1887.
Seven Continental Ports	Barrels. 1,223,247	Barrels. 1,274,474
London	250,412	218,474
Total Stocks afloat and ashore	1,473,659	1,492,921
Decrease in stocks since August 20.	19,262	

A detailed statistical table giving the stocks on hand, the stocks in vessels on the ocean, and the amount unloading from the vessels at the different ports, is appended, which shows at a glance the condition of affairs abroad and the increase or decrease as compared with the corresponding period of 1886. The shipments represent the amount of oil going to the interior of Europe from the seaports:

STOCKS IN FOREIGN PORTS SEPTEMBER 24, 1887.

PORTS.	Stocks week ending Sept. 24		Stocks afloat week ending Sept. 24		Loading. Week ending Sept. 24		Grand total stocks afloat and load ng.		Receipts From July 1.		Shipments from July 1.	
	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.
London	119,147	167,812	26,562	18,800	29,000	64,600	174,709	250,412	66,786	215,189	117,300	148,496
Bremen	226,932	175,058	11,188		27,000	19,000	265,120	194,008	162,711	204,983	147,155	180,311
Hamburg	145,486	195,676	100,684	65,828	48,700	88,500	294,870	350,004	260,769	400,936	269,948	290,311
Antwerp	144,075	149,089	52,759	31,431	105,000	77,700	301,834	258,220	179,301	205,556	195,926	161,149
Rotterdam	95,963	87,276	42,295	40,072	21,000	7,000	159,258	134,348	150,312	197,261	136,318	160,050
Amsterdam	5,865	12,740	32,805	34,258	8,500		92,170	46,998	51,324	28,004	67,957	46,494
Stettin	56,413	150,016	65,749	35,851	27,000	5,000	149,152	190,867	133,992	206,240	94,372	93,736
Danzig	20,411	19,600	17,132	29,152	6,000		45,543	48,752	20,908	9,404	15,836	15,970
Total	740,145	789,455	322,602	236,592	243,200	197,200	1,305,947	1,223,247	959,347	1,252,384	927,512	948,021
Total stocks Continental Ports									1,314,663	1,005,422	740,145	789,455
Total afloat,									189,556	283,908	322,602	236,592
Total loading									322,400	162,600	243,200	197,200
Total									1,826,619	1,451,930	1,305,947	1,223,247
Afloat and loading for direct Continental Ports									63,000	2,300		
" " " Baltic Sea, exclusive Stettin and Danzig									16,000	29,700	26,000	13,600
" " " Total Continental Ports									1,905,619	1,483,930	1,331,947	1,236,847
" " " Total London									291,276	210,806	174,709	250,412
" " " English harbors, exclusive London									89,200	99,500	206,800	45,600
Grand total									2,259,095	1,794,316	1,713,456	1,532,859

OFFICIAL STATEMENT—EXPORTS OF PETROLEUM, AUGUST, 1887.

BY WM. F. SWITZLER, CHIEF OF BUREAU OF STATISTICS, WASHINGTON, D. C., SEPT. 9, 1887.

CUSTOMS DISTRICTS	MINER'L CRUDE		NAPHTHAS		ILLUMINATING		LUBRICATING & PARAFFINE OILS		RESIDUUM		TOTAL	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Boston and Charles-town, Mass.			200	50	756,866	68,745	7,881	1,679			764,941	70,474
New York, N. Y.	3,636,465	232,391	643,563	55,634	31,829,377	2,418,564	1,086,791	295,063	3,570	425	58,099,766	3,002,080
Philadelphia, Pa.	3,035,935	169,787	24,910	1,993	14,743,803	1,087,313	27,149	2,295	149,100	6,132	17,980,897	1,267,520
Baltimore, Md.					597,503	40,096	27,399	4,194			624,902	44,290
Total for Aug., 1887	6,672,400	402,181	668,673	57,677	47,927,545	3,614,718	2,019,220	303,231	152,670	6,557	57,470,506	4,384,364
Total for Aug., 1886	6,271,495	403,682	1,538,518	148,802	38,559,639	2,983,505	1,179,849	237,025	1,008	91	47,550,509	3,778,105
Total for 8 months ending Aug. 31, 1887	42,657,067	2,699,632	7,106,259	597,698	308,631,341	23,715,234	12,886,120	2,195,090	2,752,092	128,684	373,982,879	29,336,358
Total for 8 months ending Aug. 31, 1886	44,447,632	3,036,937	6,557,256	576,382	316,025,123	23,835,354	8,668,626	1,653,973	1,367,100	78,301	377,065,737	31,180,990

CRUDE QUOTATIONS FOR SEPTEMBER, 1887.

Day of Month and week.	BRADFORD.				OIL CITY.				NEW YORK.				PITTSBURGH.			
	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed	Opened	Highest	Lowest	Closed
T 1	64 3/4	65 3/4	63 3/4	65 1/4	64 3/4	66	63 3/4	65 1/2	64 3/4	65 3/4	63 1/2	65 3/8	64 1/4	66	63 1/2	65 3/8
F 2	65 1/2	65 3/4	64	64 3/4	65	65 3/4	64 3/4	64 3/4	65 3/4	65 3/4	64	64 1/4	65 3/4	65 3/4	64	64 3/4
S 3	64 1/2	65 3/8	61 1/8	64 3/8	64 1/2	65 3/8	64 3/4	64 3/8	64 3/4	65 1/8	64 3/8	64 3/4	64 1/2	65	64 3/4	64 3/4
M 5	64 3/4	65 1/2	64 3/4	65 1/2	64 3/8	65 3/8	64 3/8	65 1/2					64 3/4	65 1/2	64 3/4	65 1/2
T 6	65 3/8	66 3/8	65 1/4	65 3/4	65 3/4	66 3/8	65 1/4	65 3/8	65	66 3/4	65	65 3/8	65 3/4	67	65 1/4	66
W 7	65 3/8	68 3/8	65 3/4	67 3/4	66	68 3/8	65 3/8	67 3/4	65 3/4	68 3/4	65 3/4	67 3/4	65 3/8	69	65 3/4	67 3/4
T 8	67 3/8	70 1/4	67 3/8	69	68 3/8	70	68 3/8	69 3/8	67 3/4	70	67 3/8	69 1/4	67 3/4	70	67 3/4	68 3/8
F 9	69 1/4	69 3/4	68 3/8	69 1/4	69 1/4	69 3/4	68 3/4	69 3/8	69 3/8	70	68 3/8	69 1/4	69 3/8	69 3/4	68 3/8	69 3/8
S 10	69 3/4	71 3/8	69 3/4	71	70	71 3/8	69 3/4	71	70	71 1/2	69 3/8	71 3/8	69 3/4	71 3/8	69 3/8	71 3/4
M 12	71 3/4	71 3/4	71 1/4	74 3/8	72	74 3/4	71 1/4	74 3/4	71	74 1/2	71	71 1/2	71 3/8	74 3/4	71 1/2	74 3/8
T 13	74 3/4	74 3/4	68 1/4	68 1/4	74 3/4	75	67 1/4	68	75	75	67 3/8	68 1/4	75	75 1/2	67 3/8	68 3/8
W 14	68 3/4	68 1/2	62	62 1/2	68 3/8	68 3/8	62	62 1/2	68 3/8	69	62	62 1/2	69	69	62	62 1/4
T 15	62	65	62	65	62 1/2	65 1/8	61 3/8	65 3/8	63	65 1/4	62	64 3/8	62 1/4	65 1/4	61 3/8	65
F 16	65	67	64 1/4	64 1/4	65	67	64 3/4	64 3/4	65 1/4	67 3/4	64 1/4	64 3/4	65 1/4	67	64 3/4	64 1/2
S 17	64 3/4	65	64	64 3/4	64 1/2	65	64	64 1/2	65	65	64	64 3/4	64 1/2	65	64	64 1/8
M 19	61 1/2	65 3/4	64 1/2	65 3/4	64 1/2	65 3/8	64 1/2	65 3/8	64 1/2	65 3/4	61 1/2	65 1/4	64 1/4	65 3/8	64 1/4	65 1/2
T 20	65 3/8	65 3/4	63 3/4	64 1/2	65 3/4	66	63 1/2	64 3/8	65 3/8	65 3/8	63 3/8	64 3/8	65 3/8	65 3/8	63 3/8	64 3/8
W 21	64 3/4	66 3/4	64 3/4	66 1/4	64 3/4	66 3/8	64 3/4	66 3/8	64 1/2	66 3/8	61 3/8	66 1/4	64 3/4	66 3/8	64 3/4	66 1/2
T 22	66 3/8	68 3/8	65 3/4	67 3/8	66 3/4	69	66	67 3/8	66 3/4	69	65 3/8	67 3/8	66 1/2	69 1/4	65 3/8	67 3/8
F 23	67 3/8	68 3/8	67 1/4	68 3/4	68	69	67 1/2	68 3/4	68	69	67 1/2	68 3/4	68	69	67 3/8	68 3/8
S 24	69	69 1/4	67 3/4	68 3/4	69	69 1/4	67 1/2	68 3/4	69	69	67 1/2	68 3/4	69 3/4	69 3/4	67 3/8	68 3/4
M 26	68 3/4	68 3/4	67 3/8	68	68 3/8	68 3/8	67 3/4	68	68 3/4	68 3/8	67 3/4	68	68 3/8	68 3/8	67 3/8	68
T 27	68 3/8	68 3/4	66 3/8	67 3/8	68	68	66 3/8	67 3/8	68	68	66 1/2	67	68	68	66 1/2	67
W 28	67 3/4	67 3/4	66 3/8	67 3/8	66 3/4	67 3/8	65 1/2	67 3/8	67 3/8	67 3/8	66 3/8	67 1/4	67 3/8	67 3/8	66 1/2	67 1/4
T 29	66 3/4	67 3/4	66 3/8	67 3/8	67 3/8	68	66 3/8	67 3/8	67 3/8	67 3/8	66 3/8	67 3/8	67 3/8	68	66 3/8	67 3/8
F 30	67 1/4	68 3/8	67	68 1/2	67	69	66 3/4	68 3/8	67 1/4	68 3/8	67	68 3/8	67	69	66 3/8	68 3/8

Runs, Shipments and Stocks.

RUNS OR RECEIPTS.

PIPE LINE	SEPT., 1887	AUG., 1887
National Transit Co.	1,181,633.42	1,253,897.36
Tidewater	165,195.06	168,007.25
Octave Oil Co.	2,108.09	3,153.10
Keystone Pipe Line	20,434.44	20,374.10
Pittsburgh Pipe Line	168,343.98	92,495.57
Southwest Pennsylvania	305,088.65	303,507.05
Total	1,842,832.74	1,843,434.33
Daily average	61,427.76	59,465.62

In the above runs only the oil received by the National Transit Co. directly from the wells, is included.

DELIVERIES OR SHIPMENTS.

PIPE LINE	SEPT., 1887	AUG., 1887
National Transit Co.	1,843,686.10	1,836,506.12
Tidewater	216,961.79	204,275.15
Octave Oil Co.	3,290.75	2,735.00
Keystone Pipe Line	33,094.58	28,506.52
Pittsburgh Pipe Line	171,878.77	94,263.21
Southwest Pennsylvania	414,736.46	403,842.71
Total	2,643,668.35	2,570,128.71
Less oil transferred between lines	525,759.54	448,506.92
Total	2,117,908.81	2,121,621.79
Daily average shipments	71,930.29	68,439.41

In the above shipments only the oil delivered to refiners is included.

Daily excess of shipments over runs, September	10,502.53
Daily excess of shipments over runs, August	8,973.79
Daily excess of shipments over runs, July	1,373.97
Daily excess of shipments over runs, June	4,915.93
Daily excess of shipments over runs, May	5,072.36
Daily excess of shipments over runs, April	4,083.45
Daily excess of shipments over runs, March	7,983.78
Daily excess of shipments over runs, February	3,564.10
Daily excess of shipments over runs, January, 1887	8,702.88
Daily excess of shipments over runs, December	11,270.81
Daily excess of shipments over runs, November	10,818.57
Daily excess of shipments over runs, October	580.75
Daily excess of shipments over runs, September	8,057.13
Daily excess of runs over shipments, August	11,931.56
Daily excess of runs over shipments, July	5,557.20
Daily excess of runs over shipments, June	4,793.41

NET STOCKS.

PIPE LINE	SEPT. 30, 1887	AUG. 31, 1887
National Transit Co.	23,329,702.40	28,490,551.79
Tidewater	1,535,337.29	1,545,709.89
Octave Oil Co.	4,368.47	3,590.00
Keystone Pipe Line	16,528.74	29,138.88
Pittsburgh Pipe Line	133,200.63	133,979.58
Southwest Pennsylvania	945,631.63	1,055,108.50
Total	30,964,779.16	31,258,078.64

Stocks decreased September	293,299.48
Stocks decreased August	284,874.16
Stocks decreased July	47,794.24
Stocks decreased June	174,012.20
Stocks decreased May	286,403.15
Stocks increased April	112,893.77
Stocks decreased March	257,699.31
Stocks decreased February	105,988.75
Stocks decreased January, 1887	777,975.85
Stocks decreased December	357,196.56
Stocks decreased November	286,526.86
Stocks decreased October	1,790.72
Stocks increased September	214,072.99
Stocks increased August	262,652.56
Stocks increased July	188,510.62
Stocks increased June	216,583.97
Stocks increased May	110,800.44
Stocks decreased April 1886	165,635.61

	RECEIPTS.	DELIVERIES.
Daily average September	61,428	71,930
Daily average August	59,466	68,439
Daily average July	59,769	61,143
Daily average June	63,413	68,329
Daily average May	64,522	69,594
Daily average April	65,072	66,988
Daily average March	63,915	71,899
Daily average February	63,374	66,928
Daily average January, 1887	62,629	71,332
Daily average December	67,857	79,127
Daily average November	70,767	81,586
Daily average October	76,015	76,600
Daily average September	77,989	69,932
Daily average August	76,880	64,949
Daily average July	74,880	63,323
Daily average June	75,811	71,017
Daily average May	68,602	64,635
Daily average April 1886	64,228	69,127

NOTE—The above figures are in barrels of 42 gallons each, and include only the pipe lines of the New York and Pennsylvania oil regions. In addition to the above receipts from 1200 to 16 00 barrels of oil a day are shipped by rail out of the region by large producing firms which have no chartered pipe line.

SHENANGO & ALLEGHENY R. R.

TAKES EFFECT MONDAY, JULY 11, 1887.

Trains are run by standard Central Time (90th Meridian.)

NORTHWARD.			STATIONS.			SOUTHWARD.		
6	4	2				1	3	5
P. M.	A. M.	A. M.				A. M.	A. M.	P. M.
6 35	11 55	8 20	Ar.	Greenville	Dp	6 50	11 10	3 50
6 25	11 45	8 10		Shenango		7 00	11 20	4 00
6 13	11 32	7 58		Krem		7 11	11 32	4 11
6 04	11 23	7 50		Fredonia		7 20	11 42	4 20
5 58	11 18	7 45		Coolspring		7 24	11 46	4 25
5 57	11 16	7 44		Kerby Siding		7 25	11 47	4 26
5 47	11 05	7 35		Mercer		7 35	11 57	4 37
5 37	10 55	7 25		Pard e		7 45	12 07	4 46
5 33	10 51	7 20		Filer		7 49	12 11	4 50
5 26	10 44	7 12		Grov City		7 58	12 18	4 58
5 23	10 41	7 09		Re d		8 00	12 20	5 00
5 13	10 30	6 59		Harrisville		8 11	12 31	5 13
5 08	10 26	6 54		Wick		8 15	12 35	5 17
5 03	10 21	6 49		ranchton		8 20	12 40	5 22
5 00	10 18	6 45		Coaltown Junction		8 21	12 41	5 23
4 57	10 16	6 42		Keisters		8 24	12 44	5 26
4 53	10 12	6 39		Shippery Rock Park		8 29	12 47	5 29
4 50	10 09	6 36		Hallston		8 32	12 50	5 32
4 42	10 01	6 28		Enclid		8 42	1 00	5 42
4 33	9 52	6 18		Jacksonville		8 51	1 10	5 52
4 25	9 45	6 10		On lla		8 59	1 18	6 00
4 15	9 35	6 01		P. & W. Junction		9 10	1 30	6 10
4 05	9 30	5 55		Dp	Butler	9 13	1 35	6 15
				Pittsburgh & Western R. R.				
				Allegheny		11 20	4 00	8 00
P. M.	A. M.	A. M.				A. M.	P. M.	P. M.

HILLIARD BRANCH.

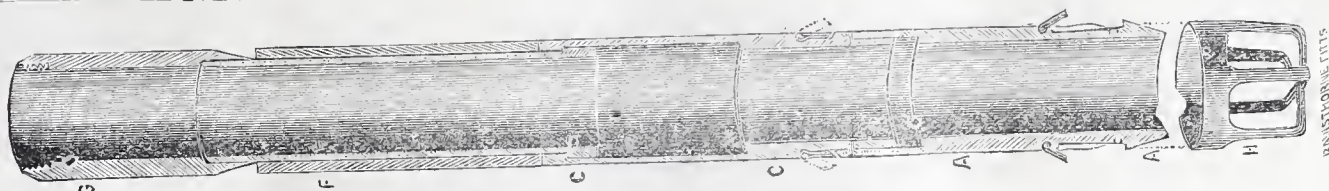
34		32	STATIONS.		33	35
A. M.		A. M.			A. M.	P. M.
12 00	6 40	Ar.	Branchton	Dp	8 45	5 30
11 50	6 35		Bovard		8 55	5 35
11 30	6 15		Annandale		9 15	6 00
11 20	6 07		Roy		9 25	6 10
11 00	6 00	Dp.	Hilliard	Ar	9 35	6 20
A. M.		A. M.			A. M.	P. M.

Trains 4 and 5 run daily with through coach service between Allegheny, Chautauqua Lake and James own, N. Y. All other trains daily except Sunday.

I. D. STINSON, G. P. A.,
Greenville, Pa.

J. T. BLAIR, Gen. Man.,
Greenville, Pa.

Pat. July 6, '86. MILLER AUTOMATIC PACKER Pat. July 27, '87.



PACK GUARANTEED.

FOR OIL AND GAS WELLS.

EASILY DRAWN OUT

Supports the Casing and Packs at any Point in the Well.

JUST THE PACKER FOR WELLS HAVING LEAKY CASING. Packers for 6 in. and 5½ in. wells have 4¼ in. inside diameter to drill or pump through. Reduced to any size tubing for flowing wells or gas wells.

Also packers for 7½ in. and 8 in. wells have 5¾ in. or 6 in. inside diameter. Write for Circular.

Telephone 523.

MILLER & McCONNELL, 144 Fifth Av., Pittsburgh, Pa.

THE PETROLEUM AGE.

ACME OIL COMPANY,

→ **REFINERS OF PETROLEUM** ←

MANUFACTURERS OF THE

CROWN ACME OIL

Prepared with Great Care for Family Use.

ABSOLUTELY SAFE,

AND THE

Best Illuminator in the World.

WORKS AT OLEAN, N. Y., & TITUSVILLE, PA.

MAIN OFFICE, 26 BROADWAY, N. Y.

B. B. CAMPBELL, CHAIRMAN.

B. P. CRAWFORD, TREASURER.

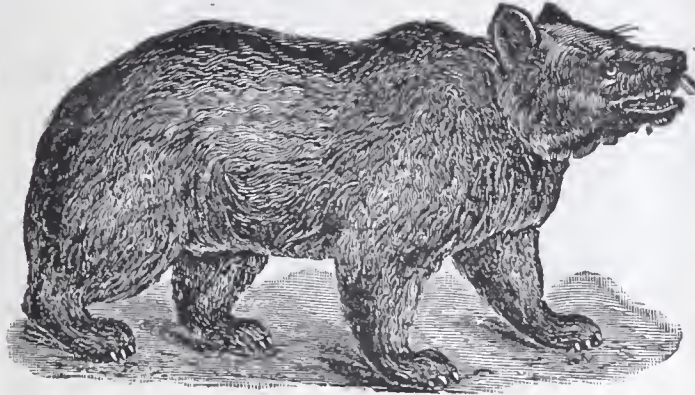
BEAR CREEK REFINING CO., (LIMITED.)

REFINERS

OF THE BEST

Illuminating Oils

MADE.



BRANDS :

URSOLEUM—Strictly water white, 48° gravity, or better, fire test, 150°.

RAILROAD.—Water white, 47° gravity, fire test, 150°.

BEAR CREEK — Standard white, 46° gravity, fire test, 110°.

Gasolines and Deodorized Benzines of excellent quality and all gravities.

REFINERY, COLEMAN STATION, A. V. R. R. OFFICE, COR. 11TH & ETNA STS., PITTSBURG, PA.

JOHN COCHRAN,

MANUFACTURER OF J. M. DAVIDSON'S

PATENT REVERSE TWIST STEEL SUCKER RODS.

We would call the attention of Producers to the fact that these Rods have been improved by upsetting the end before welding, giving about double the stock in the weld.

The advantages of these Rods over wooden are

No Rivets, No Warping, No Waiting for Rods to Settle Through Paraffine.

A special advantage is where wells are pumped with sucker rod motion. The new rods are giving the best of satisfaction to parties using them.

Rods made for 1 1-4 inch and 2 inch Tubing.

Factory: Chestnut Street, Near B., B. & K. Freight Depot,
LOCK BOX 1543, BRADFORD, PA.

THE STANDARD PRESSURE REGULATOR.

Designed Especially for Natural Gas.

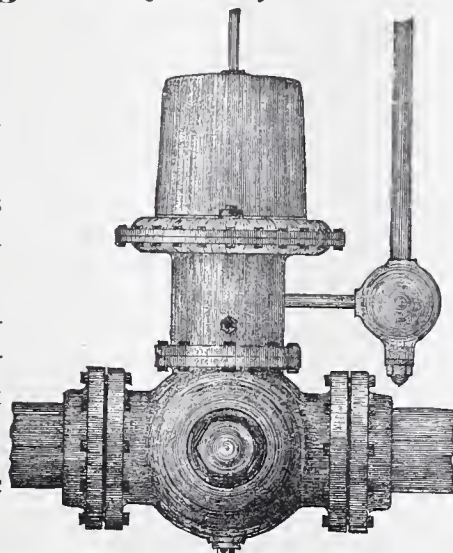
Patented Nov. 10, 1885.

We deliver 2 to 20 oz. from 25, 50 or 100lb. High Pressure Main.

We can furnish these valves with flanges suitable for connection to 3, 4 or 6-in. supply.

They are guaranteed to deliver an even flow from a variable supply; to work without pulsating.

House Valves—No. 1, 1x2 inches; No. 2, 1 1-4x2 1-2 in.



[6-IN. MILL OR STREET MACHINE.]

For full particulars, terms, etc., address.

Patented Jan. 26, 1886.

Attention is directed to our method of freeing Natural Gas from dirt or other foreign matter before passing seats of valves. The Plug shown at bottom of cut opens into inlet passage, and through this opening any dirt may be removed.

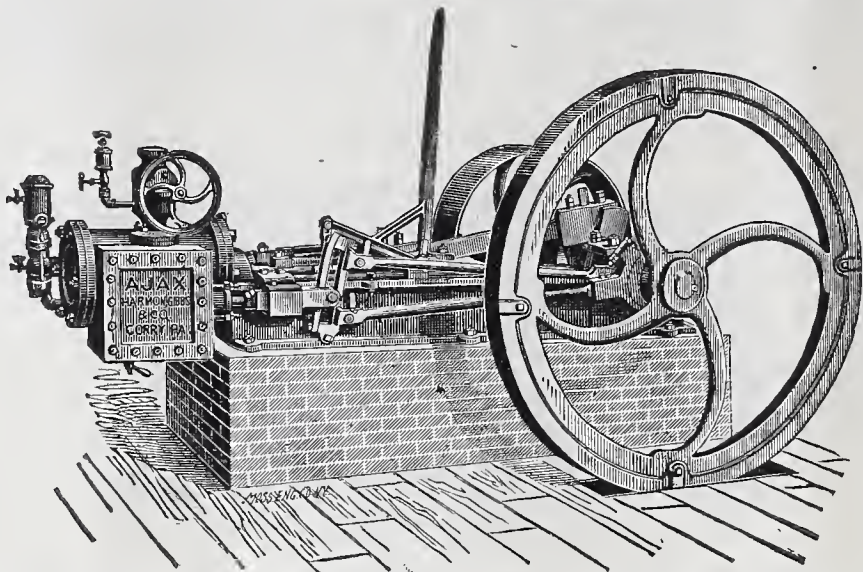
This feature will be appreciated by those using from recently completed lines.

We have two sizes, Nos. 6 and 7. Where a variation of 1-2 oz. is permissible we recommend No. 6; where it is necessary to govern with less variation, No. 7.

E. C. MERRILL & CO.,

5919 Broad Street, Pittsburgh, Pa.

THE AJAX ENGINE,



Manufactured by Harmon, Gibbs & Co.,

Is still the favorite in every field from the 400 feet wells of Grand Valley to the 3,000 feet wells of Washington. Economy in Fuel, Strength, Power, Speed and Durability are its strong points. Nearly 2,000 now in use, and you may travel from Wellsville, N. Y., to Macksburg, O., and not find one in a junk or repair shop.

We finish them in the shop and do not have to follow them into the field to make them run. Record of "Ajax" No. 1105 over 22,000 feet and still drilling.

JAMES M. LAMBING, General Agent, Corry, Pa.

OFFICE OPPOSITE PASSENGER DEPOT.

VICK'S FLORAL GUIDE.

If you are in want of Garden, send 10 cts. or anything for the SEEDS for above, which can be deducted from the first order.
JAMES VICK, SEEDSMAN, ROCHESTER, N. Y.

Buffalo, Rochester & Pittsburgh R. R.

BUFFALO AND ROCHESTER DIVISION.

May 22, 1887.

Eastern Time.							
STATIONS.							
P. M.	A. M.	P. M.	A. M.	Ar. Buffalo..	Lv	A. M.	P. M.
7 15	6 20	11 00		" Rochester "			7 50
3 16				" Salamanca "			11 44
2 30	3 30	8 00		Lv. Bradford. Ar	11 00	8 00	12 30
6 00						P. M.	P. M.
	2 15			Ar do Lv		12 55	
	11 38			" Ridgway "		3 26	
	10 14			" Falls Creek "		4 51	
	10 08			" Dubo's "		4 58	
	9 00			" Punxsutawney		5 59	
	A. M.			Lv Ar			

Thousand.Mile Tickets sold at Two Cents per mile.

Connections made at Salamanca with the N. Y., P. & O. R. R. for all points West and Southwest; also with the Erie R. R. for all Eastern points; at Bradford with the Narrow Gauge system to all points in the Oil Regions.

JAS. T. GARDNER, Sup't. I. S. EMERY, Gen. Pass. Agt.

Warren and Farnsworth Valley Railroad.

Narrow Gauge Railroad to Garfield, Vandergrift and Dunham's Mills.

	A. M.	P. M.		A. M.	P. M.
Clarendon, Lv....	8 00	5 40	Garfield, Lv....	9 00	6 30
Garfield, Ar.....	8 52	6 25	Clarendon, Ar..	9 52	7 22

Trains are run on P. & E. R. R. time. Freight delivered at Vandergrift, one and one-quarter miles south of Garfield, and at Dunham's Mill, five miles west of Garfield.

A. D. WOOD, General Manager.

PETROLEUM REAL ESTATE CO

C. D. ANGELL,

OFFICE: 59 MAIN ST., BRADFORD, PA.

Buy, sell and lease all kinds of Oil Lands and City Property, Negotiate Contracts and do a General Commission Business. Information carefully given. Address Lock Box 1275.

BRADFORD, BORDELL & KINZUA

AND

Bradford, Eldred & Cuba Railroad.

May 29, 1887.

WEST.		STATIONS.		EAST.	
Exp.	Mail.			Exp.	Mail.
P. M.	A. M.			A. M.	P. M.
5 20	11 50	Ar.....	Bradford.....	Lv	7 25
4 45	11 15	"	Kinzua Junction.....	"	8 05
4 38	11 10	"	McCalmont.....	"	8 10
4 36	11 08	"	Rew City.....	"	8 13
4 13	10 48	"	Rixford.....	"	8 31
4 08	10 43	"	Duke Centre.....	"	8 36
3 50	10 25	"	Eldred.....	"	8 55
3 32	10 10	"	Bullis Mills.....	"	9 10
3 17	9 54	"	Ceres.....	"	9 26
3 04	9 40	"	Little Genesee.....	"	9 40
2 55	9 30	"	Bolivar.....	"	9 50
2 34	9 06	"	Allentown.....	"	10 14
2 05	8 35	Lv.....	Wellsville.....	Ar	10 15
P. M.	A. M.				
7 30	10 45	Ar.....	Bradford.....	Lv	8 30
6 55	10 10	"	Kinzua Junction.....	"	9 10
6 47	10 02	"	Aiken.....	"	9 17
6 41	9 56	"	Davis.....	"	9 23
6 35	9 50	"	Simpson.....	"	9 30
6 25	9 40	"	Orm-by.....	"	9 40
5 50	9 05	"	Smethport.....	"	10 15
5 50	9 05	"	Mt. Jewett.....	"	10 15
5 15	8 30	Lv.....	Kane.....	Ar	10 50

Sunday Train leaves Smethport at 8:25 a. m., arriving at Bradford at 10 a. m. Returning leaves Bradford at 3:30 p. m. arriving at Smethport at 5:10 p. m.

JOHN C. MCKENNA, Superintendent.

AMERICAN STEAM LAUNDRY

GODFREY & HUNT., Proprietors.

WORKS NOS. 9 TO 17 BISHOP STREET.

OFFICE 55 MAIN ST., - - - BRADFORD, PA.

TELEPHONE.

DELIVERY WAGONS.

J. W. McFARLAND.

J. B. HOWE.

McFARLAND & HOWE,

BROKER IN OIL PRODUCTION.

81 MAIN STREET.

Buys, Sells and Leases all kinds of Oil Properties. Information carefully given.

ADDRESS LOCK BOX 1925, BRADFORD, PA.

JAMES C. BOYCE,

ATTORNEY AT LAW,

Solicitor of Patents and Attorney in Patent Causes.

ROOM NO. 3,

Over Oil Well Supply Company, Limited.

Corner Main and Webster streets, - - BRADFORD PA.

FOR OIL OR GAS WELL PACKERS

SEND YOUR ORDERS TO

S. R. DRESSER, BRADFORD, PA.,

Who will fill them promptly with

The Best Malleable Iron Frame and Superior Quality of Rubber.

He Makes a Specialty of the Packer Business and Can Give You

Anything in that Line.

Philadelphia & Erie Railroad.

Time Table in Effect Nov. 15, 1886. | Eastern Standard Time.

EASTWARD.		Kane Express No. 18.	Day Express No. 8.	Erie Mail No. 4.	Kane Accom. No. 12.
Erie	Lv.	7 35 a.m.		2 45 p.m.	5 25 p.m.
Corry	"	9 00 "		1 13 "	6 55 "
Irvineton	"	9 50 "		5 00 "	7 50 "
Warren	"	10 05 "		5 15 "	8 05 "
Kane	Ar.	11 25 "		6 30 "	9 15 "
Kane	Lv.		6 25 a.m.	6 55 "	
Johnsonburg	"		6 58 "	7 30 "	
Emporium Junction	"		8 30 "	9 15 "	
Lock Haven	"		11 15 "	11 58 "	
Williamsport	"		12 20 p.m.	1 25 a.m.	
Harrisburg	Ar.		3 13 "	4 30 "	
Philadelphia	"		6 50 "	8 25 "	
WESTWARD.		Erie Accom. No. 11.	Erie Mail No. 3.	Niagara Express No. 11.	Erie Express No. 17.
Philadelphia	Lv.		11 25 p.m.	7 40 a.m.	
Harrisburg	"		3 30 a.m.	11 25 "	
Williamsport	"		7 10 "	2 25 p.m.	
Lock Haven	"		7 58 "	3 15 "	
Emporium Junction	"		10 30 "	6 25 "	
Johnsonburg	"		12 00 m.	8 02 "	
Kane	Ar.		12 40 p.m.	8 35 "	
Kane	Lv.	6 35 a.m.	1 00 "		4 10 p.m.
Warren	"	7 45 "	1 58 "		5 25 "
Irvineton	"	7 58 "	2 09 "		5 45 "
Corry	"	8 55 "	2 56 "		6 45 "
Erie	Ar.	10 10 "	4 00 "		8 05 "

Trains daily except Sunday.

THROUGH-CAR ARRANGEMENT WESTWARD—Erie Mail—Pullman Palace Sleeping Cars Philadelphia to Erie, and Philadelphia to Williamsport (cars open to receive passengers at Philadelphia at 10 00 p.m.), and Washington to Williamsport. Passenger Coaches from Philadelphia to Erie, and Baltimore to Williamsport.

Niagara Express—Pullman Parlor Car Philadelphia to Williamsport.

THROUGH-CAR ARRANGEMENT EASTWARD—Day Express—Pullman Parlor Car Williamsport to Philadelphia. Passenger Coaches Kane to Philadelphia, and from Williamsport to Baltimore.

Erie Mail—Pullman Sleeper Erie to Philadelphia, and Williamsport to Philadelphia (Car open to receive passengers at Williamsport at 9 00 p.m.) Passenger Coaches Erie to Philadelphia, and Williamsport to Baltimore. Sleeping Car Williamsport to Washington.

DUNKIRK, ALLEGHENY VALLEY & PITTSBURGH R.R.

Going North.	Express. No. 2.	Mail. No. 4.	Sunday. No. 6.
Titusville, leave	7 35 a.m.	3 20 p.m.	7 35 a.m.
Grand Valley	8 03 a.m.	3 48 p.m.	8 01 a.m.
Irvineton	8 45 a.m.	4 36 p.m.	8 44 a.m.
Warren	8 58 a.m.	4 53 p.m.	8 56 a.m.
Junction	9 55 a.m.	5 45 p.m.	9 48 a.m.
Lily Dale	10 50 a.m.	6 36 p.m.	10 37 a.m.
Dunkirk, arrive	11 25 a.m.	7 10 p.m.	11 12 a.m.
Going South.	Mail. No. 1.	Express. No. 3.	Sunday No. 5.
Dunkirk, leave	9 25 a.m.	4 00 p.m.	2 40 p.m.
Lily Dale	10 03 a.m.	4 38 p.m.	3 14 p.m.
Junction	11 02 a.m.	5 46 p.m.	4 08 p.m.
Warren	11 55 a.m.	6 44 p.m.	5 06 p.m.
Irvineton	12 10 a.m.	7 00 p.m.	5 22 p.m.
Grand Valley	12 58 p.m.	7 49 p.m.	6 12 p.m.
Titusville, Ar.	1 20 p.m.	8 15 p.m.	6 40 p.m.

WHEELING AND LAKE ERIE

And Cleveland and Marietta R. R's.

Time Table—In effect July 18, 1887.

Central Standard Time

EASTWARD.		No. 5.	No. 7.	No. 9*	No. 1*
Toledo	Lv	7 45a.m.	1 00p.m.	4 50p.m.	
Oak Harbor	Ar	8 41	1 53	5 45	
Fremont		9 07	2 18	6 08	
Clyde		9 24	2 34	6 23	
Bellevue		9 40	2 48	6 37	
Monroeville	Lv	9 58	3 05	7 01	3 10a.m.
Norwalk		10 15	3 22	7 17	3 22
Wellington		11 05	4 13	8 08	4 03
Creston	Ar	11 53	5 05	8 55p.m.	4 47
Orrville	Ar	12 20p.m.	5 35	9 15a.m.	5 15*
Orrville	Lv	12 40	5 40	7 00	7 00
Massillon	Ar	1 24	6 20	7 42	7 42
Massillon	Lv	1 20	6 20	7 42	7 42
Navarre		1 35	6 35	8 00	8 00
Valley Junction	Lv	2 15	7 20	8 45	8 45
New Cumberland		2 28	7 33	9 05	9 05
Sherro'sville		2 40	7 45	9 25	9 25
Lecsville		2 48	7 53	9 40	9 40
Bowerston	Ar	2 55p.m.	8 00p.m.	9 50a.m.	9 50a.m.
Canal Dover		3 42p.m.	5 52a.m.		
Newcomerstown		4 28	6 30		
Cambridge		5 25	7 30		
Macksburg		6 56	9 03		
Marietta	Ar	8 10p.m.	10 15a.m.		
WESTWARD.		No. 6.	No. 8.	No. 4.	No. 2*
Marietta	Lv	6 50a.m.	12 15p.m.		
Macksburg		8 04	1 26		
Cambridge		9 40	3 00		
Newcomerstown		10 50	4 00		
Canal Dover		11 32a.m.	4 40p.m.		
Bowerston		11 25a.m.	3 45p.m.	6 35a.m.	
Leesville		11 32	3 55	6 43	
Sherrodsville		11 40	4 10	6 53	
New Cumberland		11 52	4 25	7 07	
Valley Junction		12 20p.m.	5 02	7 25	
Navarre		12 50	5 35	8 00	
Massillon		1 05	5 50	8 15	
Orrville	Ar	1 40	6 25	8 53	
Orrville	Lv	1 45	6 35*	8 58	*
Creston	Lv	2 18	7 02	9 28	5 30a.m.
Wellington		3 05	7 43	10 15	6 20
Norwalk		3 55	8 25	11 25	7 25
Monroeville		4 07	8 35	11 57	7 35
Bellevue		4 23	9 15	11 55	7 51
Clyde		4 39	9 29	12 10p.m.	8 06
Fremont		4 55	9 45	12 28	8 23
Oak Harbor		5 20		12 53	8 45
Toledo	Ar	6 15p.m.	10 45*	1 50p.m.	9 40a.m.

HURON DIVISION.

NORTHWARD.		No. 23.	No. 25.	No. 27.
Monroeville	Lv		8 15a.m.	2 40p.m.
Norwalk	Ar		8 35	3 25
Norwalk	Lv	6 25a.m.	8 35	4 00
Milan		6 45a.m.	9 00	4 20p.m.
Fries Landing			9 12	
Huron	Ar		9 30a.m.	
SOUTHWARD.		No. 24.	No. 26.	No. 28.
Huron	Lv		1 15p.m.	
Fries Landing			1 30	
Milan		6 55a.m.	1 45	5 00p.m.
Norwalk	Ar	7 15	2 10	5 22p.m.
Norwalk	Lv	7 30	2 10	
Monroeville	Ar	8 10a.m.	2 30	

* Daily.

This road is now open through from Toledo to Bowerston, connecting with the Pennsylvania System for all points East.

THROUGH CAR SERVICE—Between Toledo, Cambridge and Marietta; Toledo and Bowerston; Toledo and Akron, Youngstown and Pittsburgh; Chicago, Akron, Youngstown and Pittsburgh.

M. D. WOODFORD,

General Manager.

JAMES M. HALL,

Gen'l. Pass. Agent

W. & W. R. R. TIME TABLE.

DECEMBER 27, 1886.

NORTHWARD		STATIONS.	SOUTHWARD	
No. 3	No. 1		No. 2	No. 4
P. M.	A. M.		A. M.	P. M.
2 00	6 00	Lv.....Waynesburg.....Ar	10 35	6 25
2 15	6 15	.....Sycamore.....	10 17	6 07
2 23	6 23	.....Swart.....	10 09	5 59
2 30	6 30	.....Deer Lick.....	10 02	5 52
2 38	6 38	.....West Union.....	9 53	5 43
2 47	6 47	.....Dunn.....	9 43	5 33
2 50	6 50	.....Lindley's Mill's.....	9 40	5 30
3 01	7 02	.....West Amity.....	9 28	5 18
3 06	7 08	.....Luellen.....	9 22	5 12
3 11	7 13	.....Baker.....	9 17	5 07
3 14	7 20	.....McCracken.....	9 13	5 00
3 27	7 35	.....Vankirk.....	9 00	4 47
3 40	7 50	.....Braddock.....	8 48	4 33
3 55	8 05	Ar.....Washington.....Lv	8 35	4 20
6 36	9 55	Ar.....Pittsburg.....Lv	6 10	1 55

P. C. & St. L. R. R.

Time given above is Central Standard, which is 40 minutes slower than Pittsburg or local time, or one hour slower than Eastern time.

The Company reserve the right to vary from this schedule as circumstances may require. All trains daily except Sunday.

C. E. BOWER, Superintendent.

The PITTSBURG & WESTERN RAILROAD Time Table**NORTHERN DIVISION.**

STATIONS.		27		17	
		P. M.	A. M.	A. M.	
Bradford	Lv.			6 00	
Mt. Jewett	Lv.			7 40	
Kane				10 10	
Sheffield Junction				11 04	19
Marienville				11 47	P. M.
Tylersburg				12 27	
Clarion Junction			6 20	1 14	4 00
Clarion			6 50	12 35	3 30
Shippensburg	23		6 30	1 18	4 14
Knox			6 45	1 45	4 33
St. Petersburg		A. M.	7 24	2 30	5 20
Foxburg		5 40	7 38	3 00	5 40
Parker		5 50	7 48	3 10	
Bruin		6 08	P. M.	8 06	3 31
Peoria		6 18		8 17	3 45
Karns		6 22	7	8 22	3 50
Millerstown		6 36		8 36	4 07
St. Joe		6 50	A. M.	8 50	4 25
Butler		7 18	5 1	9 30	5 25
Renfrew		7 39	5 28	9 46	5 45
Callery Junction		8 05	5 50	10 10	6 05
Allegheny	Ar	9 30	7 10	11 20	7 20

A. M. A. M. P. M. P. M. P. M.

NORTHWARD TRAINS

STATIONS.		28	8	18	24	26
		A. M.	A. M.	A. M.	P. M.	P. M.
Allegheny	Lv.	3 15	9 20	7 20	12 40	5 35
Callery Junction		4 40	10 40	8 35	1 50	6 50
Renfrew		5 02	11 00	8 55	2 13	7 12
Butler		5 20	11 20	9 18	2 36	7 30
St. Joe				9 45	3 08	8 00
Millerstown			A. M.	10 00	3 23	8 14
Karns				10 15	3 38	8 28
Petrolia			20	10 20	3 45	8 32
Bruin				10 32	3 56	8 43
Parker		A. M.		10 52	4 15	9 00
Foxburg		6 2		11 25	4 40	9 10
St. Petersburg			6 44	11 41	4 54	
Knox			7 49	12 32	5 40	
Shippensburg			8 11	12 53	5 58	
Clarion Junction			8 30	1 14	6 10	
Clarion			9 00	1 45	6 40	
Tylersburg				1 48		
Marienville				2 26		
Sheffield Junction				3 06		
Kane	Ar			3 58		
Bradford	Ar			4 40		

A. M. P. M. P. M. P. M.

Westbound trains leave Callery Junction as follows:

Cleveland and Toledo Express 8.35 a. m., New Castle Accommodation 4.43 p. m., Chicago Express, with through Sleeping Car. 1.44 p. m., Zelenople Accommodation 6.55 p. m.

No. 17 makes direct connection at Allegheny with B. & O. R. R. for Washington and Baltimore.

No. 19 connects at Foxburg with A. V. R. R. for Franklin and Oil City.

SUNDAY TRAINS Nos. 23 and 26 will run daily. Nos. 18 and 17 will run daily between Butler and Allegheny. No. 23 connects at Callery Junction for Allegheny and New Castle. No. 26 gets connections from Allegheny and New Castle. All other trains run daily, except Sunday.

THOS. M. KING, General Manager.

C. W. BASSETT, General Passenger Agent.

JOHN F. STRATTON,

49 Maiden Lane,

New York.



Importer, Manufacturer and Wholesale Dealer in all kinds of Musical Merchandise, Musical Boxes, Band Instruments. Stratton's Celebrated Russian Gut Violin Strings.



FRANK B. CONVERSE

BANJO.

ORIGINAL SURVEY
PENNSYLVANIA
1887

THE PETROLEUM AGE.

VOL. VI.

BRADFORD, PA., NOVEMBER, 1887.

No. 10.

THE GAS TERRITORY OF INDIANA.

CONCLUDING ARTICLE.

[DR. A. J. PHINNEY IN INDIANAPOLIS NEWS.]

A CAREFUL study of the southern portion of the productive gas area at Portland, Winchester and Muncie has revealed the presence of arches or ridges having a northeast and southwest direction. The presence of these ridges has much to do with the local accumulation of the gas. At Muncie the ridge has been quite distinctly shown by the drill, and the wells that are located on its northern slope have so far given the greatest volume of gas. The highest portion of the ridge is seventy-four feet and the lowest thirty-eight feet above sea level. The latter is the only failure for Muncie, and as it yielded a small flow it might have proven a good well if it had been shot. At Winchester the ridge is north of the city, and the difference in elevation as shown in Nos. 1 and 3 is fifty feet. The presence of these cross-cut ridges or arches are favorable factors in determining why certain localities should be more fortunate than others, even where all are within the gas area. It is not claimed that these northeast and southwest ridges are everywhere in the gas area, though they may be. It is quite probable that there are other lines of structure that exert even a greater influence. While these low arches or ridges do not merit the term anticline that I have previously applied to them, yet they are no accident of structure but have been formed in obedience to some force, for they are characteristic of the Trenton limestone. Professor T. C. Chamberlin, of the United States geological survey, recently called my attention to a similar condition or structure in southwestern Wisconsin. He is quite prepared to accept the theory previously stated and which he repeats in the following:

"The Trenton limestone was in this region deposited in a series of cross waves, which have the effect of local domes competent to collect and retain the gas generated within the strata." The extent of these cross waves and their distance apart can not be determined. A careful study of all the conditions present at each locality is necessary in order to determine the structural features that exert the greatest influence in the flow of gas.

The accumulation of gas in large quantities is the result of the upheaval that formed the Cincinnati arch—the reservoir. That the gas is found in this arch is no accident, but the result of certain well defined and fixed laws that govern not only the distribution of gas, but oil and salt water as well. Gas and oil will no doubt be found in the Trenton in many places outside of the gas area proper, but the flow will be small. Because a little gas or oil is found at any locality we need not expect that a large reservoir is close at hand. Every little ridge, the crest of every local dome, may yield a little gas or oil, but we need not expect to find gas in large

quantities outside of the gas area, or where the upper surface of the Trenton is 100 feet below sea level. As oil has a specific gravity less than water we shall expect to find it above the latter, but below the gas, so we may expect to find the oil in close proximity to the gas.

The sooner we understand the relation that the salt water, oil and gas sustain to each other the better we will be able to determine the probability of finding either at any locality. People do not desire to invest from \$1,200 to \$2,000, and secure a twenty-five-dollar gas well in return; five or ten barrels of oil per day is no return for the expense of sinking a well. All such wells outside of the gas area are worse than a dry hole, for they stimulate renewed efforts.

Around the margin of the gas belt, as shown on the map is an area a few miles wide that is as yet undeveloped; some wells will prove productive, others failures. Careful guidance here with systematic research will save thousands of dollars to the people of our State. One well that yields salt water from the Trenton when it is drilled into a few feet is sufficient for that locality. It has cost the people of this State thousands of dollars to learn that the statement that gas and oil are as likely to be found in one locality as another is untrue. The theory that gas and oil may be looked for in spots all over northern Indiana, or that oil rather than gas may be looked for north of the Wabash river, and the reliance placed upon every smell of petroleum to sustain this assumption, has proven a delusion and a snare. It is not even a reasonable hypothesis, much less a scientific statement or theory. I speak of course of gas and oil in paying quantities.

The above conclusions regarding the profitable gas field of Indiana have only been reached after a careful study of all the facts that it has been possible to obtain, since the investigation first began. Having a record of nearly every gas well that has been drilled in the State, then careful study whether they have been successes or failures, has thrown a flood of light upon the structural features present in the gas area. The explanations that have been offered are only such as the facts themselves have suggested, and I believe that they are the only legitimate conclusions that can be drawn from the facts revealed by the drill. It is possible that other gas fields may yet be discovered, but, if so, they will probably be small compared with the one just described. If the many failures outside of the gas belt afford any means of judging, then we feel justified in predicting that investigations outside of the 100 foot dead line will be attended with nineteen chances for failure to one for success; at any rate there is so little probability of finding gas in paying quantities that no one will be justified in making such an outlay in their search for it as has characterized their past efforts.

On the other hand it must not be presumed that every well in the gas belt will prove productive; some will prove failures, no doubt. However, there has been so few failures that one can drill with a reasonable proba-

bility of securing a good return for the investment. The southern limit of the gas district is not as yet clearly defined. It is probable that fairly productive wells may yet be found south of Greenfield, but they may not be near any large town or city.

In the above statements I have referred only to the gas area in the Trenton limestone. The other gas-bearing rocks have so far proven of so little value that sufficient study has not been given them to enable one to offer any suggestions that would be of value. Where a good flow of gas is obtained at any horizon above the Trenton it would be policy to cease drilling and see how long the flow may last; should it prove fairly persistent it would be wise to develop that horizon rather than lose all by going deeper.

The Utica shale, Hudson river shale, Niagara and cor-niferous limestones, the New Albany black shale and many of the sandstones of the coal measures, all contain more or less gas and petroleum, but so far as now known the structural features of these rocks are such that no large reservoirs are provided for the accumulation of gas. A little gas and oil may be found at many horizons, but this affords no means of determining the probabilities of what will be found in the Trenton limestone at any given locality. Much has been said regarding the Trenton rock, some claiming that the porosity is the prime factor in the storage of the gas; others believe in the existence of large caverns and crevices in this formation. A careful study of the well records show that in every instance where a large flow has been obtained the rock is simply porous, the flow feeble at first, increases as the drill penetrates the rock. There are no cases on record where the drill has suddenly dropped as it would have done had it entered a cavity or large crevice. If any such exists, the drill has not succeeded in finding them. As the increase of the flow is gradual, this is proof that the drill is penetrating a porous rock, and only for the flow would develop suddenly if large open spaces or crevices were drilled into. With the facts before us we may for the present consider the reservoir as simply porous rock, with every interstice filled with gas.

The gas-bearing portion of the Trenton is confined to the upper 50 feet. Experience has demonstrated that no flow of importance is obtained below this depth in the rock. The porous portion varies not only in thickness but in the depth at which it is formed. Usually a hard shell is first met when the Trenton is struck, it may be from 2 to 20 feet thick. In wells drilled less than one-fourth of a mile apart one may find the rock porous near the top and a fine flow soon be obtained; in another the drill may not reach the porous portion until it has been sunk 5, 10, 15 or 20, or even more feet. All the large wells show the rock porous so far as penetrated. In such case, no doubt, a still larger supply would have obtained had it been practicable to drill further with such a strong flow of gas. The gas bearing portion usually varies in thickness from 2 to 10 feet, the first giving wells of feeble flow, the latter those ranging from 1,000,000 to 3,000,000 cubic feet per day. Occasionally two or more gas-bearing horizons are found. The rock is, as a rule, very porous where it is found productive close to the salt water horizon, and some of the largest wells in the State are found where the Trenton is 15 or 20 feet above the horizon. If salt water and gas are found in one or two wells, others located one or two miles away toward the higher level of the Trenton will probably find dry gas in abundance.

At Kokomo wells Nos. 1 and 2 both yield gas and salt water, but Nos. 3, 4 and 5 dry gas in large quantities.

No. 5 is probably one of the large wells of the State. If Kokomo was situated three or four miles west of its present location it would have to pipe all the gas it used; but the people of that city need borrow no trouble about the supply when an abundant supply can be obtained within a stone's throw of the city. A few other smaller towns located near the dead line for gas have found fairly productive wells, and all such can secure sufficient by locating other wells further away from the salt water.

ADDENDA.

The above was written the 1st of July, and although the drill has been actively at work during the interval up to date no facts have been revealed that in any way show that the conclusions above presented are not true. Every well that has been drilled has strengthened the position taken and shown in a clearer light the structure of our gas area. It was expected that the gas area, as shown on the map, would be enlarged in some directions. The boundary of the 100 feet below sea level line could, owing to a lack of borings, only be approximately determined. Outside of this boundary is a belt a few miles in width where gas may occasionally be found in paying quantities. Gas has been found in paying quantities at Sheridan and Arcadia, in Hamilton county. Sheridan is about twelve miles northwest of Noblesville and Arcadia about eight miles north. If the data from Sheridan is reliable the Trenton is still above the 100-foot dead line. Whether this high portion of the Trenton continues eastward to Arcadia or Noblesville remains to be determined, if so it will probably prove productive. Sufficient drilling has not been done south of Greenfield to enable one to point out the gas areas more definitely than is indicated on the map. A strong flow of shale gas was struck at North Vernon at a depth of 145 feet, and at Jeffersonville at 80, 110, 276 and 313 feet. As both these finds have so far proved persistent it is possible that another gas horizon may be found in the section of the State that will yield gas in paying quantities. At North Vernon the upper surface of the Trenton is 270 feet below sea level, too low to find gas if the 100 sea level is the salt water horizon here. Two wells drilled at this point have failed to find gas in the Trenton rock. At Jeffersonville the Trenton is far below sea level and as all the strata here dip rapidly to the westward the probabilities are that if the Trenton contains gas the reservoir will be found somewhere to the east of Jeffersonville. I shall expect to see gas found in paying quantities between Greenfield and the Ohio river on the western slope of the Cincinnati arch, and I would suggest that efforts be made to find the Trenton where it is between 75 and 100 feet below sea level. Shelbyville found the Trenton 65 feet below sea level, but no gas. Greensburg has three fairly productive wells from the Trenton, its upper surface being about sea level. If the search for gas south of Greensburg is carried on in a systematic manner and the location of the wells made with some definite object in view, thousands of dollars will be saved and the probabilities of finding gas will be much greater. We have yet much to learn regarding the structure of the Trenton in southern Indiana. As the Hudson river group becomes more calcareous southward, questions arise as to the sufficiency of the cover, etc., that can not be answered at present. Wells drilled at Cambridge City and Hagerstown found the upper surface of the Trenton 176 and 167 feet above sea level. At Richmond the Trenton was found 64 feet above sea level, and at Liberty, south of Richmond, 74 feet above sea level. The subordinate

fold to the main body of the Cincinnati arch, shown in figure 4 of the first article, is thus more clearly revealed as the investigations are carried forward.

GEOLOGICAL FORMATIONS.

The geological formations of central eastern Indiana exhibit a great degree of uniformity of composition as well as a persistence over wide areas. The investigation for gas has enabled us to determine the existence of formations, the presence of which could only be surmised without the aid of the drill. For the first time the thickness of the Niagara group has been determined to a certainty. The following section of the Union City well, furnished me by Mr. A. Jaqua, will give a good idea of the formations penetrated at that point:

<i>Union City Section.</i>	Feet.
Drift.....	98
Niagara limestone.....	212
Clinton limestone.....	15
Bluish shale } Hudson river shale.....	400
Gray shale }	
Brown shale } Utica shale }	175
Black shale }	80
Trenton limestone.....	525
St. Peter's limestone.....	100
Total.....	1780

The following sections are selected in order to show the variations in character and thickness of the different formations:

<i>Bluffton Section.</i>	Feet.
Drift.....	12
Niagara limestone.....	283
Clinton and Medina.....	75
Hudson river shale.....	305
Utica shale.....	285
Trenton limestone.....	150
Total.....	1200

<i>Muncie Section, Combined.</i>	Feet.
Guelph beds } Niagara }	90
Springfield beds }	185
Niagara shale }	40
Hudson river and Utica shales.....	611
Trenton limestone.....	481
St. Peter's sandstone.....	150
Total.....	1507

<i>Richmond Section.</i>	Feet.
Hudson river and Utica shales.....	880
Trenton limestone.....	510
Total.....	1390

<i>Noblesville Section.</i>	Feet.
Drift.....	140
Limestone.....	286
Shale, Hud. Riv. and Utica.....	410
Trenton limestone.....	7
Total.....	843

<i>Newcastle Section.</i>	Feet.
Drift.....	380
Shale, Hud. Riv. and Utica.....	490
Trenton limestone.....	226½
Total.....	1096½

<i>Huntington Section.</i>	Feet.
Drift.....	2
Limestone.....	400
Shale.....	595
Trenton limestone.....	39
Total.....	1036

<i>Bridgeport Section.</i>	Feet.
Drift.....	160
Black shale (Devonian).....	140
Limestone.....	360
Shale.....	490
Trenton limestone.....	50
Total.....	1200

<i>Pendleton Section.</i>	Feet.
Drift.....	5
Carboniferous limestone.....	2
Sandstone (Devonian).....	14
Shale.....	20
Limestone (Niagara).....	200
Shale.....	5
Limestone.....	4
Shale.....	610
Trenton limestone.....	87
Total.....	947

<i>Valparaiso Section.</i>	Feet.
Drift.....	125
Black shale (Devonian).....	95
Limestone.....	610
Shale.....	5
White and gray limestone.....	55
Bluish green shale (Hudson river).....	160
Chocolate colored limestone.....	265
Total.....	1285

THE ST. PETER'S SANDSTONE.

The thickness of this formation is not known. It has been penetrated 150 feet. The name calciferous sand-rock would be decidedly appropriate to this rock as revealed by the drill, for while it has the physical appearance of a sandstone, all the tests show that its grains are calcareous. A small residue of silica remains, and a few quartz crystals can usually be detected with the aid of a magnifier. This formation is heavily charged with salt water, popularly termed "Blue Lick" water.

THE TRENTON LIMESTONE.

The thickness of this formation varies from 481 to 525 feet. The color is usually a light buff, and sometimes whitish or chocolate. It seems to be a solid mass of limestone throughout its entire thickness without any beds of shale. In texture it varies from very fine and compact to coarse and porous. It has been penetrated at only a few points. The depth to which the drill is sunk in it is usually from 10 to 100 feet.

THE UTICA SHALE.

The average thickness of this formation is about 285 feet, some sections showing, however, a little more, others a little less. In some sections nearly the whole of the Hudson river and Utica shale is of a dark brown color, so that it is impossible to determine the limits of either formation. In the section at Muncie the transition from the bluish green of the Hudson river shales to the brown of the Utica shales was so gradual that it was impossible to assign any definite thickness to this latter formation. It is everywhere of a dark brown or chocolate color, sometimes quite black and usually quite calcareous. This formation gradually becomes thinner and more limy when followed to the northwest. At Valparaiso a chocolate colored limestone is found beneath the 160 feet of bluish green Hudson river shales. This is without doubt the western equivalent of the Utica shale, the Galena limestone of Illinois, Iowa and Wisconsin. It is everywhere highly charged with bituminous matters, and usually gives an odor of petroleum. This thick bed of impervious shale prevents the escape of the gas and oil from the Trenton limestone beneath. Its change to a limestone in the western portion of the State would not be so favorable for the retention of gas.

THE HUDSON RIVER SHALES.

This formation consists of thin beds of limestone, alternating with beds of marl. Though usually considered a shale in the well records it is sufficiently calcareous to be considered a limestone. The clay, however, increases as we pass from its outcrops to the north. The color varies from a bluish green to gray or even whitish. At Richmond 930 feet of this and the Utica shale is reported. This is an unusual thickness for the two formations. The combined thickness of these two lime shales gradually decreases as we follow it to the west and northwest, 400 feet being the average along the Wabash river. The upper portion of this group frequently shows quite thick beds of limestone, near the base thin beds of limestone frequently yield quite a flow of gas, which, however, soon blows out. The gas from the shale affords no reliable indication of gas in the Trenton rock; in fact, it is safe to say that from the time the drill starts on its downward course until Tren-

ton is struck there are no reliable indications of what the result will be.

THE CLINTON LIMESTONE.

A careful examination of the pumpings shows that the formation is 10 feet thick at Eaton. It is here of a buff color and easily identified. At Muncie and Winchester it could not be distinguished from the Hudson river group, if present. Elsewhere its lithological characteristics are not constant and it is difficult to recognize it. In all such cases it has been considered better to call all Hudson river than to assign a constant thickness to it until there was sufficient proof to justify such a statement. Future investigations will no doubt enable us to identify this formation at many localities.

THE NIAGARA GROUP.

The variation in the thickness of this group is due to two causes, viz., unequal deposition and to erosion, as this is the rock nearest to surface over most of the gas area. The section given of the Muncie well is the first one ever given showing an accurate thickness of its different subdivisions. Where the formation shows a minimum thickness the Guelph beds have all been eroded as well as a portion of the Springfield bed. The upper or Guelph beds vary in color from a buff to gray or white. Springfield beds are usually bluish green, though some portions may be white or gray. The shale is an almost pure clay, as tests so far have failed to show any lime. It is usually called soap-stone by the drillers. Its color is bluish green. In the southern portion of the State a bed of shale forms the summit of the group, but whether it is equivalent to a portion of the Guelph or is a more recent formation remains to be determined. The thickness of this group ranges from 265 to 400 feet, and unlike those just described, its thickness increases to the northwest.

THE WATERLIME OR LOWER HELDERBERG.

This is the surface rock over a large area outside of the gas belt, how large we do not know, for it has been considered in this State as of Devonian age until recently, consequently, no effort has ever been made to separate this from overlying corniferous limestone. It is present at Kokomo, Delphi and along the Wabash river, and is said to extend south nearly to Xenia, Miami county. As it is largely covered with drift it will require a good deal of careful work before its boundary can even be approximately made out. It assumes great importance in our geological series, as its maximum thickness must be nearly 400 feet. At South Bend the whole limestone mass is 800 feet thick; at Valparaiso, 670; at Huntington, 400, and at Muncie, 265. It is quite probable that it holds the same relation to the productive gas area in Indiana that it does in Ohio, where it marks the boundary of the gas field.

THE DRIFT.

The almost universal covering of the rocky strata of the gas area exhibits a remarkable variation in thickness. This variation is an index of the erosion that the rocky formation beneath had suffered previous to the glacial epoch. The usual thickness of this formation is from 50 to 150 feet, though at Frankfort it was found 280 feet thick and at Rochester 245 feet thick. At New Castle the rock bottom of the old Blue river valley is 425 feet below the Muncie and Cincinnati railroad depot. The Whitewater river is running 157 feet above its rocky bottom at Brookville and 85 feet at Connersville.

THE ORIGIN OF GAS AND PETROLEUM.

The theories advanced some years ago by Professor Newberry, T. S. Hunt and other eminent scientists regarding the origin of these products have not been very

much improved upon, though we have to-day a wider and riper experience. That they are the result of decomposition of animal and vegetable material is no longer a matter of speculation. The chemical hypothesis regarding the formation of gas from certain very complex reactions that are supposed to take place at great depths in the earth has not a single observed fact for its support. It has found many advocates simply because it promises a continuous supply. Perhaps no other explanation has gained such a hold upon the mass of the people, and for no other reason than that they desire the supply to be everlasting, and they are of course more ready to accept what is to their interests than any explanation, however susceptible of proof, that questions the supremacy of the supply. No one can tell how long the supply will last, and any estimate would be mere guess work. So far as now known there has been no diminution of rock pressure or diminished flow from any of the good wells. A few weak wells, located near the salt-water horizon, are failing, but this is to be expected. If the gas is largely derived from the volatilization of the oil, and it is probable that this is true, then we may expect the gas to last a long time. The Trenton limestone in this State probably contains in the aggregate a large quantity of petroleum, but whether it will ever be found at any locality in large quantities the future must determine. With the present price for oil, 20 cents per barrel, it is to be hoped that no paying oil field will be developed at present, as the oil will have a greater value as a source of gas than when placed upon the market. While we may hope that the supply of gas will prove sufficient for many years, it would be the part of wisdom to prevent the lavish waste that has been going on for the past few months. It is also wise, to say the least, to be on the safe side, and to draw no more from our reservoir than our needs demand. Even admitting that the gas is constantly being generated there is no probability that this process is taking place with anything like the rapidity that it is escaping from the many wells, hence, it is reasonable to infer that the time will come when our wells will have a diminished flow.

ROCK PRESSURE AND OPEN PRESSURE.

Most of the gas wells in the gas belt show a pressure when confined of from 320 to 340 pounds per square inch; this confined pressure is the rock pressure. A few wells may show a little more and a few a little less, but this is the average. The larger wells reach the maximum in one, two or three minutes, the smaller may require hours. The confined pressure of a well is no indication of its capacity, as it may show 325 pounds and not yield over 25,000 cubic feet per day. The rapidity with which the pressure increases enables one to make a relative comparison of the capacity of different wells. The maximum is reached in wells flowing from 1,000,000 to 3,000,000 cubic feet per day in from one to three minutes; larger wells sooner than this; but all, whether large or small, eventually reach the same when confined. As the rock pressure is essentially the same all over the gas field, it indicates a common cause, and to what shall we look for that cause? We have shown that outside of the gas area the Trenton limestone is full of salt water that is crowding up into the higher portion from below and from all sides except the south-east. As this salt water rises to considerable heights in the wells where found it is evident that it is itself subjected to considerable pressure, and it is prevented from rising into the high area because of the presence of the gas and oil that now fill the porous portions of the rock.

A simple calculation will show the upward pressure of the salt water. In the Huntington well, No. 2, it rose 950 feet, or 780 feet above 100 feet below sea level. The diameter of the well being $5\frac{5}{8}$ inches, we have 134.5 cubic feet of water above this line, or 8,49.3 pounds. This, divided by 21.8, the area of the well in square inches, gives us 323 pounds per square inch as the pressure of the salt water; but as no gas has yet been found at the depth at which the water was struck at Huntington, the pressure would be somewhat less in all our gas wells. Where gas is found in shale beds and not influenced by the salt water the pressure does not often exceed 50 pounds, and the same is true where the gas bearing rock is near the surface. These wells are called low pressure, to distinguish them from those having a much higher pressure. The difference is one of degree rather than of kind, though the cause is quite different. In a low pressure well the force is due to the expansion of the gas alone, the compression of the gas in the reservoir being dependent upon the quantity that is crowded into any given space; consequently the greater the compression the greater the expansion when it is given vent. In high pressure wells we have besides the expansive force that naturally belongs to the gas, an additional force, viz., the pressure of salt water. Under this enormous force the gas must be very much reduced in bulk, 1,000 cubic feet not occupying the space of over 40 or 50 cubic feet. The explanation given above is the only one that is sustained by the facts brought to light during the recent investigations. However, we can all frankly admit that there is yet much to learn,

The open pressure of a gas well is the force of the escaping gas as shown by a steam gauge or mercury gauge. Wells having a capacity of from 1,000,000 to 2,000,000 cubic feet per day show from 1 to 8 pounds when all the gas is escaping from one two-inch pipe. Large wells should be tested from larger pipes. From the open pressure the velocity is determined by Professor Robinson's method. After obtaining this the volume is easily found. When large wells are allowed to blow off through two-inch pipes at once the pressure is sometimes very great, but as there is more or less accumulated pressure in the well, owing to the inability of all the gas to escape, calculations made from such tests are not reliable, as they do not show the full capacity of the well.

THE GAS WELLS.

It is at present impossible to give any correct figures regarding the capacity of the majority of the wells of the State. Most of them have been much overestimated. In order to do justice to all they should be tested under similar conditions and with reliable gauges. At present the gauges in use vary so much that it will be necessary to adopt a standard before we can hope to get anything reliable in the way of tests. Some of the wells have been tested with a gauge that a person can easily blow to $3\frac{1}{2}$ pounds, while in one that is reliable, or in a mercurial gauge from $1\frac{1}{2}$ to $1\frac{3}{4}$ is the limit for persons of ordinary strength of lung. Where tests are made with such a gauge from the open casing or from a four-inch pipe it is not difficult to understand how the figures given may show nearly double the capacity of the well. So far as the large wells are concerned this is practically of little importance, but for small wells located near small towns is a serious matter, for it is no slight undertaking for such towns to lay mains and furnish gas to all who may desire it. They should be certain that they have sufficient for their needs before the expense of thousands of dollars for

pipe, only to learn when too late that they do not have a sufficient supply. In a list recently published, giving the capacity of the wells of the State from actual tests two wells are put at 1,000,000 cubic feet each per day, when neither of them have sufficient force to move the gauge when all the gas is flowing from one two inch pipe. The combined flow of the two wells would not exceed 600,000 cubic feet. Another well is given 4,000,000, when 1,500,000 would be a large estimate for its capacity. Better underestimate the capacity of the wells for the small towns than to overestimate it, for if such towns are unable to drill a second well, if necessary, they had not better undertake to pipe the town. Towns of 1,000 inhabitants will find it to their sorrow that 300,000 or 400,000 cubic feet of gas per day is not sufficient to supply them; 1,500,000 at least will be required as a maximum when the mercury drops 20 to 30 degrees below zero. It would not be pleasant at such a time to learn by actual experience that the supply was not equal to the demands. If such a town is situated near the salt water horizon, and its well is not strong and salt is being deposited in the pipe so that the well will require repacking from time to time, thus causing extra expense, it would be the part of wisdom to pipe the gas to the nearest factory and wait awhile before going to the expense to pipe the town, as the probability is that the flow of salt water will increase at the expense of the gas. Such a spirit of rivalry exists between the cities and towns in the gas belt that the people are satisfied to accept the test that gives them the greatest volume of gas, whether correct or not, and they naturally look with suspicion upon any person or gauge that gives them a less capacity, no matter if it is the result of a correct test. No doubt after awhile the good sense of our people will prevail, and they will see the desirability of getting exact figures even if they are not so large as are desired. All the towns or cities in or near the gas area have a bright future before them, but the size of its gas wells will have very little to do with the prosperity of any city, so long as all have sufficient, for the largest gas well has no power to draw manufactories; nothing but untiring efforts and hard work on the part of the citizens will give the towns a permanent boom. A gas well that is blowing off 2,000,000 or 3,000,000 cubic feet per day, with its terrific roar, is something the majority of people have not learned to comprehend, and it is hardly to be wondered at that they should overestimate the capacity.

Within the productive gas area there has hardly been a failure. Outside the 100-foot dead line, shown on the map accompanying article No. 2, the field is treacherous as well as on the southern limits, but within the productive gas area gas is found in paying quantities in almost every well. The first well drilled at any point may be quite small and the second a gusher equal to the largest in the State. The possibilities of any locality can not be determined until several wells have been drilled, but if one can judge from the experiences of the past he can safely predict that all can secure plenty for their needs, as the amount of gas any town has depends largely upon the number of wells drilled. There is certainly no necessity, nor policy even, in the jealousy that exists among the gas towns as to which has the largest gas well or the greatest flow of gas, as all have enough, or can get it, if they need it. Usually no reliance can be placed upon the published estimates of the capacity of the gas wells, as nearly all are represented as gushers. The writer can be pardoned for not accepting the published list of the capacity of the gas

wells of the State, which was claimed to be the result of actual tests, when to his personal knowledge wells that would not yield over 350,000 cubic feet per day were represented as yielding 1,000,000. Others that have a capacity of about 1,250,000 cubic feet were rated as 4,000,000 cubic feet wells. If all the gas towns had been treated alike, and the production of their wells inflated in the same proportion, no one could have complained, but to give the actual capacity of a few towns, and in the same list give other towns two or three times what they actually have is a gross injustice. There is no need of claiming that our gas wells are larger than they really are, for the average is large enough for all practical purposes, and the Indiana gas field is one of the largest and surest in the world. In article 1, the daily output of gas was estimated at about 80,000,000 cubic feet. Since that article was written the number of wells has been increased until the daily flow would probably exceed 200,000,000 cubic feet.

OIL REGION CHRONOLOGY.

FOR OCTOBER, 1887.

Oct. 1.—AGE oil report shows 130 wells completed in September, 34 of which are dry; new production, 2094 barrels; new rigs, 56; old rigs, 106; drilling wells, 121; total field operations, 282: decrease from last month, 6. The pipe lines report three wells completed in September at Lima, O., 5 at North Baltimore and none at Findlay. Total, 8. Wells drilling at close of month, including 2 shut down on top of sand, 13. Market opened at 68½c, advanced to 68¾c, went back to 68½c, recovered to 68¾c, weakened to 68¼c; fluctuated between ⅔ and ¾c until noon, when there were sales at 69c. At 2:30 p. m. it advanced to 69¼c and closed at 69c bid. Reibold—G. Markle No. 2, 37; Behm No. 5, 55; Behm No. 6 65; Stahm No. 3, 68 barrels an hour. Field gauge, 8177 barrels from 88 wells. Behm No. 6 made 1680 barrels in 24 hours ending this morning. Washington field gauge, 8978 barrels from 221 wells. Two wells shot the past week. Taylorstown production (included with Washington gauge), 1846 barrels from 20 wells. McKeown's Martin No. 5 is doing 552 barrels a day and leads all other wells in the field. The Buffalo, New York and Philadelphia changes its name to Western New York and Pennsylvania R. R.

Oct. 2.—Sunday. John Stewart, a farmer of Pine Grove township, Venango county, aged 50 years, committed suicide by hanging. James Averill, a fireman on the B. R. & P. R. R., seriously injured by a collision of freight trains in the Bradford yard. A well of Wolf & Kugler burned near Oil City.

Oct. 3.—Market opened at 69c, the highest point of the day; weakened to 68½c, advanced to 68¾c, sold off gradually to 67¾c, rallied to 67¾c, and closed at 67½c bid. Reibold—Z. Markle No. 2, 28; Stahm No. 3, 52; Behm No. 5, 48; No. 6, 68 barrels an hour at noon. Afterwards Stahm No. 3 drilled two feet deeper, increased to 85 and dropped off to 80 barrels. Train on the B. B. & K. R. R. overturned near Kinzua Junction, and Lawyer Cunningham has three ribs fractured. H. D. Cram, of Olean, a well known oil producer, killed in the woods near State Line, on the O. B. & W. R. R., by a falling tree. Bradford councils pass an ordinance providing for a city market. The *Daily Oil News*, a producers' journal, makes its first appearance. Violent wind storms prevail throughout the region. Grand opening of the new opera house at Titusville. House burned at Oil City; loss—\$500.

Oct. 4.—Market opened at 67½c, weakened to 67¼c, with sales at Oil City and Pittsburgh at 67c. About noon it advanced to 67¾c, and afterwards sagged off to

67¾c, and closed at 67¾c. Reibold—Z. Markle No. 2, 27; Behm No. 5, 43; No. 6, 70; Stahm No. 3, 70 barrels an hour. Well on Major Work farm, Taylorstown, shut down on account of heavy gas strike. American Steam Laundry destroyed by fire at Bradford; loss, \$12,000. House of G. Hatfield up the West Branch, burned. Loss, \$4,000; insurance, \$2,200.

Oct. 5.—Market opened at 67¾c, advanced to 68½c, broke to 67¾c, rallied to 68c and at 12:30 spurted to 68¾c. The next turn carried it to 69¼c. It sold off gradually to 68c and closed at 68½c. The decline was caused by reports that the Goehring in advance at Reibold had made a flow. Reibold—Z. Markle No. 2, 20; Behm No. 5, 45; No. 6, 65; Stahm No. 3, 68 barrels an hour. Goehring No. 1 begins showing oil. Willets well at Vanceville, Washington county, through "50 foot," and dry. Store and dwelling house of J. Epstein burned at Wilcox; loss, \$10,000. Important meeting of oil producers at Butler. Death of Hiram Hazzard, a well-known oil country citizen at Tarpot, aged 69 years.

Oct. 6.—Market opened weak at 68c, with a few sales at 67¾c, advanced to 68¾c, weakened to 68c, reacted to 68½c, and closed at 68½c bid. Reibold—Goehring No. 1 showing for a small well; Z. Markle No. 2, 20; Behm No. 5, 40; No. 6, 66 barrels on hour. Stahm No. 3, 60, and improved by drilling to 75 barrels per hour. Washington—McKeown's Martin No. 5, 23; Fergus No. 3, 25; No. 5, 33 barrels per hour. A rig and tank of oil belonging to Whitney & Wheeler burned near Bradford. A lot of empty glycerine cans at Oil Valley, McKean county, explode, seriously injuring four boys. An empty tank car explodes at Wyland Station, Washington county, and William Finley is severely hurt.

Oct. 7.—Market opened at 68½c, sagged off to 6¾c, advanced to 68¾c, and closed at 68¾c bid. Reibold—Goehring No. 1 through 37 feet of sand and showing for light producer. Z. Markle No. 2, 22; Behm No. 5, 36; No. 6, 70; Stahm No. 3, 76 barrels an hour. Production of the field, 7660 barrels from 89 wells. Bolard & Greenlee well, Saxonburg, is pumping 32 barrels a day. The Taylorstown oil companies consolidate into the Washington Oil Company, with a capital of \$1,000,000 and 10,000 acres of land. Mayor Dempsey of Bradford arrested for the alleged storing of nitro glycerine and other explosives within the city limits.

Oct. 8.—Market opened at 68½c, with sales; reacted to 68¾c; weakened to 68¾c, advanced to 68¾c and closed at 68¾c. New York closed at noon at 68¾c. Market shows an undercurrent of considerable strength and better prices are predicted. Munhall & Co.'s wildcat at Thorn Hill, Allegheny county, reported showing oil in the "100 foot." Washington gauge, 8803 barrels from 221 wells. Taylorstown included with above, 1851 barrels from 20 wells. McKeown's Martin No. 5 doing 480 barrels a day. McKeown's Martin No. 5, 20; Fergus No. 3, 27; No. 5, 32 barrels per hour. Fire at Fern City, Clarion county, destroys Shreffler's clothing store, with offices of the telegraph and pipe line. Loss, \$4,500. Perry Gustavson, a Swede laborer, commits suicide at Kane by hanging.

Oct. 9.—Sunday. Reibold gauges—Stahm No. 3, 65; Z. Markle No. 2, 20; Behm No. 5, 32; No. 6, 65 barrels an hour.

Oct. 10.—Market opened at 68¾c, followed by sales at 69c, weakened to 68¾c; advanced with a few reactions to 69¾c, and closed at 69c. Carrying rates, 35@40c. Reibold gauges—Stahm No. 3, 55; Z. Markle No. 2, 18; Behm No. 5, 32; No. 6, 65 barrels per hour. McBride &

Golden well, on the Lonitz farm, Saxonburg, showing considerable gas.

Oct. 11.—Market opened firm at 69 $\frac{3}{4}$ c, with sales; settled off to 69 $\frac{1}{4}$ c bid, advanced steadily with numerous fluctuations to 70 $\frac{3}{4}$ c, and closed at that figure bid. At Oil City it was bid up to 71 $\frac{1}{8}$ c. Reibold gauges—Stahm No. 3, 58; Z. Markle No. 2, 17; Behm No. 5, 30; No. 6, 58 barrels per hour. McBride and Golden well at Saxonburg sprays some oil with its heavy volume of gas. Western and Atlantic Pipe Line makes its run of oil from the Washington field. P. Canning, a well-known oil man and real estate dealer of Oil City, while laboring under temporary insanity, threw himself into the Erie canal at Buffalo. Small fire in the Witherop block, Titusville.

Oct. 12.—Market opened at 71c bid, advanced to 72 $\frac{1}{8}$ c, sold off to 69 $\frac{1}{2}$ c, and closed at 70c bid. Reibold—Stahm No. 3, 56; Z. Markle No. 2, 17; Behm No. 5, 28; No. 6, 50 barrels per hour. Geo. R. Behm No. 5 ten feet in the sand, with 500 feet of oil in the hole. Phillips stops the drill with this well. Two-story dwelling of Mrs. Kelley on New street, Titusville, destroyed by fire.

Oct. 13.—Market opened with sales at 70c, advanced to 70 $\frac{1}{2}$ c, broke to 69 $\frac{3}{4}$ c, rallied slowly to 70 $\frac{1}{2}$ c, and with numerous fluctuations rose to 71 $\frac{1}{8}$ c. During the last half hour of the session it advanced quickly to 72c, weakened and closed at 71 $\frac{5}{8}$ c. Reibold—Geo. R. Behm No. 5 starts up moderately and at two o'clock had increased to 100 barrels an hour. A. H. Behm No. 5, 40; No. 6, 60; Stahm No. 3, 56; Z. Markle No. 2, 17 barrels an hour. Golden well on the Lonitz farm, Saxonburg, spraying oil at the rate of 30 barrels a day. Fall of a veranda at Oil City, precipitating a number of boys a distance of 18 feet, and three are seriously hurt. Fire at Oil City destroys the Lake Shore engine house and ten box cars. Loss, \$10,000. The engines were saved.

Oct. 14.—Market opened at 71 $\frac{5}{8}$ c, advanced to 71 $\frac{3}{4}$ c, broke to 71c, reacted with few fluctuations to 71 $\frac{7}{8}$ c, weakened to 70 $\frac{7}{8}$ c, and closed at 71c. Golden & Co.'s well at Saxonburg reported good for 200 barrels a day. In the evening it was making 16 barrels an hour. Reibold—Hourly gauges A. H. Behm No. 5, 30; No. 6, 60; G. R. Behm No. 5, 75; Stahm No. 3, 50; Markle No. 2, 16 barrels per hour. The McLain farm well at Taylorstown is reported a heavy gasser. Gas in the Major Work farm well has decreased sufficiently to permit of deeper drilling. Munhall well on Brush Creek, Allegheny county, doing 60 barrels a day from the "100 foot." Joseph McCaull and Wm. Ferchner, two oil country drillers, burned to death in Goodwin's planing mill, at Cygnet, Ohio.

Oct. 15.—Market opened at 70c, one cent below last night's close, on receipt of bearish news from the Saxonburg field; broke to 69 $\frac{1}{2}$ c, reacted to 70 $\frac{1}{4}$ c, and declined to 70c. Towards the end of the session it advanced to 70 $\frac{3}{8}$ c, and closed at 70 $\frac{1}{4}$ c. Golden well at Saxonburg 11 feet in the sand and doing 8 barrels an hour. Reibold—G. R. Behm No. 5, increased to 105 barrels an hour. Production of the field, 8,049 barrels, from 92 wells. At a late hour in the evening the principal wells gauged as follows: Z. Markle No. 2, 15; A. H. Behm No. 5, 25; No. 6, 51; G. R. Behm No. 5, 90; Stahm No. 3, 48 barrels per hour. Washington—McKeown's Martin No. 5 doing 20 barrels an hour. Mayor Dempsey, of Bradford, fined \$100 for violating a city ordinance in storing empty glycerine cans of the Rock Glycerine Co. within the city limits. The case appealed to court.

Oct. 16.—Sunday. Saxonburg well made 225 barrels yesterday and 140 barrels to-day.

Oct. 17.—Market opened firm at 70 $\frac{3}{4}$ c bid, broke

slowly to 70 $\frac{1}{2}$ c, advanced to 71c, then to 71 $\frac{7}{8}$ c; declined to 71 $\frac{3}{8}$ c, and closed at 71 $\frac{5}{8}$ c bid. Saxonburg well reported off to 4 barrels an hour. Production of this well for 24 hours, ending at 3 p. m., 130 barrels. Reibold—Hourly gauges, A. H. Behm No. 5, 27; No. 6, 52; G. R. Behm No. 5, 60; Stahm No. 3, 42; Z. Markle No. 2, 14 barrels. Kent House at Lakewood, on Chautauqua Lake, destroyed by fire. Loss, \$60,000. J. & H. Neville, two brothers of St. Petersburg, drowned in the Allegheny river at Foxburg, while repairing a bridge.

Oct. 18.—Market opened at 71 $\frac{3}{4}$ c bid, but the first sales were made at 72 $\frac{1}{8}$ c, and advanced steadily to 73c. It broke back to 72 $\frac{1}{2}$ c; then, after fluctuating between 72 $\frac{1}{2}$ c and 74c for a couple of hours, advanced to 74 $\frac{3}{8}$ c. During the last fifteen minutes it broke suddenly to 72 $\frac{3}{8}$ c and closed at 72 $\frac{3}{4}$ c bid. Carrying rates, 35@55c. Final Meeting of Producers' Protective Association at Bradford, at which arrangements were perfected to shut down Nov. 1st. Over eighty per cent. of the producers reported to have joined the movement. Saxonburg well made 143 barrels in the last 24 hours. Reibold gauges—A. H. Behm No. 5, 25; No. 6, 47; G. R. Behm No. 5, 50; Stahm No. 3, 42; Z. Markle No. 2, 16 barrels per hour. Leans defeat the Fats of the Bradford Oil Exchange at base ball. Score—13 to 12. Still explodes at Cleveland Oil Company's refinery at North Clarendon.

Oct. 19.—Market opened amid great excitement at 74c, advanced to 75c, broke to 74 $\frac{3}{4}$ c, rallied to 75c, with sales at 75 $\frac{1}{8}$ c. At Pittsburgh sales were made at 75 $\frac{3}{8}$ c, and at Oil City at 75 $\frac{1}{8}$ c. It afterwards declined, going down to 73 $\frac{1}{4}$ c, and closed at 73 $\frac{7}{8}$ c bid. Carrying rates, 35@45c. Golden well at Saxonburg increased from 8 to 13 barrels an hour. Reibold gauges—G. R. Behm No. 5, 50; A. H. Behm No. 5, 24; No. 6, 50; Stahm No. 3, 42; Z. Markle No. 2, 14 barrels per hour. G. R. Behm No. 6 starts at 18 barrels an hour, and increased to 40 barrels in the evening. McLain farm well, Taylorstown, strikes a heavy gas vein. Collision at Great Valley on the Erie road, and several men severely hurt. Terrible explosion of natural gas at Pittsburgh, and fifteen persons more or less seriously injured. Two will die. Damages—\$60,000.

Oct. 20.—Market opened weak at 74c, sold off to 73 $\frac{1}{8}$ c, advanced to 73 $\frac{3}{8}$ c, broke to 72 $\frac{3}{8}$ c, and closed at 73c. Golden well at Saxonburg increased to 10 barrels an hour; made 644 barrels the past four days. Reibold gauges—Z. Markle No. 2, 16; A. H. Behm No. 5, 23; No. 6, 35; Stahm No. 3, 40; G. R. Behm No. 5, 34; No. 6, 90 barrels an hour. Excelsior Oil Company of Cleveland, makes an assignment. Charles Sicardi, of New York, files a claim for \$74,000 against the Keystone Refining Company of Oil City, and asks the Franklin Court to appoint a receiver.

Oct. 21.—Market opened at 73c, advanced gradually to 74c. During the last hour it advanced to 74 $\frac{1}{2}$ c, and closed at 74 $\frac{3}{8}$ c. Golden well at Saxonburg made 162 barrels for 24 hours ending at 3 p. m. Reibold gauges—Z. Markle No. 2, 16; A. H. Behm, No. 5, 22; No. 6, 42; Stahm No. 3, 37; G. R. Behm No. 5, 33; No. 6, 50 barrels an hour. An oil strike reported from Hutchinson, Kan. First snow storm of the season in the oil regions. Failure of the Alpha Refining Company at Sarnia, Ont. David Barnhardt of Millerstown, commits suicide by cutting his throat. Wm. Reed, an old speculative oil operator of Sewickley, drowned in the Atlantic at Somers' Point, N. J.

Oct. 22.—Market opened firm at 74 $\frac{1}{2}$ c, advanced 74 $\frac{5}{8}$ c, broke to 73 $\frac{1}{2}$ c, rallied to 74c and closed at 73 $\frac{7}{8}$ c. Bolard, Greenlee & Co.'s well on Widow Lonitz farm, strikes

the sand. Reibold gauges—6860 barrels from 93 wells. Washington gauges—8386 barrels from 221 wells. Five wells were torpedoed during the week.

Oct. 23.—Sunday. Heavy windstorm throughout the Lower Oil Country; numerous derricks blown down and two unfinished buildings demolished at Oil City; seventy-five derricks destroyed in the heavy oil district about Franklin. Samuel Woodward's refinery burned near Parkersburg, W. Va. Loss \$13,000.

Oct. 24.—Market opened firm at 74c, advanced to 74½c, broke to 74c, and then on the report that Bolard & Greenlee's well at Saxonburg, was showing large, went down quickly to 73½c, reacted to 73¾c, and declined to 73c; it afterwards broke to 71¼c, and then to 70¾c and closed at 71¾c bid. At Oil City it sold off to 70½c, and at Pittsburgh to 70¾c. Bolard & Greenlee well on Widow Lonitz farm at Saxonburg, starts off at 100 and increased to 120 barrels an hour. McBride well made 66 barrels last 24 hours. Reibold gauges—Z. Markle No. 2, 14; A. H. Behm No. 5, 20, No. 6, 37; Stahm No. 3, 32; Geo. R. Behm No. 5, 27; No. 6, 30 barrels an hour. Geo. Rice, of Marietta, O., files his 13th complaint against the Standard Oil Company with the Inter-State Commerce Committee at Washington. Residence of Henry Fogle burned at Kinzua Village.

Oct. 25.—Market opened at 71¾c, advanced quickly to 72¼c, settled back to 71½c, rallied to 72¼c, and upon more bearish reports from Saxonburg, broke to 71¼c. It recovered to 71½c, but again went to pieces, selling down to 69¾c, and closed at 70c. Carrying rates, 25c to 35c. Pittsburgh clearances reach above 6,000,000 barrels. Bolard & Greenlee well at Saxonburg doing 65 barrels per hour in the afternoon. Golden & McBride well drilled deeper and increased to 10 and then drops back to 7 barrels an hour. Reibold—Phillips' wells gauge as follows: Z. Markle No. 2, 14; A. H. Behm No. 5, 24, No. 6, 41; G. R. Behm No. 5, 27, No. 6, 25; Stahm No. 3, 35 barrels per hour. Manufacturer's Gas Company of Bradford, strike another big gasser up the West Branch. Lima, O., begins to use natural gas.

Oct. 26.—Market opened firm at 70½c bid, with a few sales at 70¾c, declined to 69½c, reacted to 69¾c, broke to 67¾c, rallied to 69c, then advanced to 70¾c, and closed at 70¾c bid. Bolard & Greenlee well at Saxonburg, reported off to 40 barrels an hour. Golden & McBride well made 160 barrels last 24 hours. Reibold gauge—Z. Markle No. 2, 16; A. H. Behm No. 5, 22, No. 6, 39; G. R. Behm No. 5, 25, No. 6, 26; Stahm No. 3, 32 barrels an hour. Guffey & Co.'s well on J. R. McLain farm, Taylorstown, through the sand and dry. Logan, Emery & Weaver commence suits against the Pennsylvania Railroad in the McKean county courts for \$321,000 damages.

Oct. 27.—Market opened at 70½c, advanced to 71, settled off gradually to 70c, broke to 69¾c, reacted to 70c, and closed at 70¾c bid. Carrying rates, 30c to 40c. Bolard & Greenlee well off to 40 barrels an hour. Bolard, Greenlee & Co.'s No. 1 on Adler farm, reported 18 feet in the sand with no gas or oil. Reibold gauges—Z. Markle No. 2, 14; A. H. Behm No. 5, 20, No. 6, 42; G. R. Behm No. 5, 25, No. 6, 20; Stahm No. 3, 32 barrels per hour. Vandergrift & Reed well on the Sprowls farm, near Burnstown, Washington county, abandoned as a failure. Oil City Tube Works begin operations. Keystone Refining Company by its President, John B. Smithman, makes an assignment to Dr. R. Colbert while the Court at Franklin is hearing argument for the appointment of a receiver.

Oct. 28.—Market opened at 70½c, advanced to 71, de-

clined to 70¾c, reacted to 71½c, broke to 69¾c, and closed at 70½c bid. Carrying rates: New York, 15c; Bradford, Pittsburgh and Oil City 35c. Bolard well at Saxonburg, increased by deeper drilling to 75 barrels an hour. Bolard & Greenlee's No. 1, Adler farm, finds oil 25 feet in the sand and starts at 10 barrels an hour. Reibold gauges—Z. Markle No. 2, 15; A. H. Behm No. 5, 22, No. 6, 18; G. R. Behm No. 5, 18, No. 6, 35; Stahm No. 3, 33 barrels an hour.

Oct. 29.—Market opened at 70¾c bid, declined to 70¾c, advanced slowly to 71c, and during the last fifteen minutes strengthened to 71¾c and closed at 71¾c. Saxonburg—Bolard No. 1, on Widow Lonitz farm, 50 to 55 barrels an hour. Adler No. 1 made 200 barrels first 24 hours. Production of the Reibold field, 5440 barrels from 93 wells. Washington gauge (including wells at Taylorstown), 8045 barrels from 221 wells. Four tank cars of oil shipped from the Western & Atlantic Pipe Line station at Johnson's, Washington county, to Freedom, Pa. This is the first shipment of the new line.

Oct. 30.—Sunday. Gas reaches Bradford through the Manufacturers' line, from the Kane field. Saxonburg—Lonitz farm well, 50 to 55 barrels an hour. Well on Adler farm made 300 barrels last 48 hours. Golden & McBride's, producing at 100 barrels a day, stops flowing.

Oct. 31.—Market opened at 71¾c, declined to 71¾c, advanced to 72c, broke to 71¾c, then firmed up gradually to 72¾c, and closed at 72¾c bid. Carrying rates—Bradford and Pittsburgh, 35@40c; New York, 20c; Oil City, 45@60c. Saxonburg—Bolard No. 1, Widow Lonitz, 35 barrels an hour; Adler No. 1, 2½ barrels an hour; Golden & McBride shot with 160 quarts and responds at the rate of 30 barrels and hour. Reibold gauges—Z. Markle No. 2, 14; A. H. Behm No. 5, 12; No. 6, 35; G. R. Behm No. 5, 21; No. 6, 13; Stahm No. 3, 35 barrels an hour.

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PREPARED EXPRESSLY FOR THE PETROLEUM AGE.]

THE ASPHALTUM DEPOSITS OF NORTH ALABAMA.

BY S. S. GORBY.

OF THE GEOLOGICAL SURVEY OF INDIANA.

THE asphaltum beds of Lawrence county, Ala., lie about six miles south of Town Creek Station, on the Memphis & Charlestown Railroad. The rocks containing the bituminous deposits are sub-carboniferous sandstones, and, from their stratigraphical position, I am inclined to conclude that they should be included in the Chester group, although they may belong to the Lower Coal-Measure rocks, the conglomerate sandstones. My examinations, which were necessarily brief, were confined almost wholly to the asphaltum beds, and I was not fortunate enough to find any characteristic fossils in the sandstones sufficiently well preserved to admit of identification. The principal deposits of asphaltum occur in a ridge of sandstone that projects for a half mile or more in a northerly direction from the range of hills known as the Sand Mountains. The Sand Mountains pursue an easterly and westerly direction through the southern part of Lawrence county. The Tennessee river forms the northern boundary of the county, and follows in a general way, the direction of the mountains to the south. A broad and fertile valley ten to fifteen miles in width, lies between the mountains and the river. In the immediate vicinity of the asphaltum beds are immense deposits of iron ore of the very best quality, hematite and manganese, that might readily be worked with great benefit. The area lying between the Memphis & Charlestown Railroad and the iron ore and asphaltum deposits, is almost perfectly level, and a switch can be run out to them from any convenient point on the railroad at comparatively little expense. There is no coal in the immediate vicinity, but there is an unlimited amount of the best of timber for the manufacture of lumber, charcoal and all other purposes.

A geological section of the ridge in which the principal deposit of asphaltum occurs is about as follows:

	Feet.
Sub carboniferous sandstone.....	60
Sub-carboniferous limestone (St. Louis).....	120
Total	180

The bituminous deposits occur near the top of the ridge, which at its northern extremity terminates in a rounded plateau containing about three acres, and which is slightly elevated above that portion of the ridge connecting with the mountains to the south.

The strata in the range have a southerly dip of probably one foot in twenty-five feet, and it is probable that the asphalt beds may be found at lower geographical horizons further south. In fact, I found a number of pieces of asphaltic rock in the debris of the west slope of the ridge one-fourth of a mile, or more, south of the southern exposure of the main deposit, and I am well satisfied that the bituminous stratum continues on southward through the ridge, and that it may be found outcropping in the Sand Mountains further south.

I examined with considerable care the bituminous deposits in the plateau-like termination of the ridge, and can speak with some degree of accuracy in regard to the extent of the asphaltic rock in that locality. The deposits cover an area of about three acres at that point, averaging five feet or more in thickness. The rocks are completely saturated with asphaltum, and every seam, crack or crevice in the strata, is filled with it. There is

probably from 50,000 to 100,000 tons of asphaltic rock in this particular bed. The extent of the beds to the south have not yet been determined.

The rock containing the asphaltum is a fine-grained sandstone, composed of sharp quartz crystals, and is remarkably free from other mineral impurities. To prepare this rock for use, it is only necessary to crush it in an ordinary stamp mill, or quartz crusher, pass the crushed material through steel rollers, slightly heat it, and then press it into bricks of the proper size for pavement or other purposes. Bricks made of it by hand are very hard, tough and elastic, and capable of sustaining great pressure and much wear. The beauty, durability and other desirable features of Asphaltic pavements are too well known to require description or remark in this connection.

The asphaltum contained in the seams, cracks and fissures in the rocks contains probably not less than 80 per cent. of pure asphalt. A sample scraped up from the surface containing many impurities not found in the material taken from the rocks, was analyzed by Prof. Clifford Richardson, Inspector of Asphalts, Washington, D. C., with the following results:

	P r cent.
Loss at 212 to 220° F., for 20 hours, about.....	15.00
Loss on re-lining.....	23.50
Mineral matter.....	15.50
Pure refined asphalt.....	61.00

A portion of the rock, which, however, had weathered and drained for years, was also analyzed by Professor Richardson. The following is his statement:

Rock, a sand of good quality.....	90.68
Per cent. of sand.....	1.68
Per cent. of water.....	7.64
Per cent. of crude asphalt.....	

As before stated, the rock which Professor Richardson analyzed was taken from the surface, after it had weathered for a long period, and it contained a much smaller per cent. of asphaltum than is contained in the rocks in place. The latter probably contain not less than 15 per cent., and where they are more porous possibly as much as 20 or 25 per cent. of pure asphaltum. My opinion is that the deposits are of great value, and that they will add greatly to the material wealth of the country when properly developed.

In its natural state but little odor is emitted by the asphaltum, but when heated or burning it emits the odor peculiar to all asphaltic substances. The specific gravity of asphaltum, or bitumen, varies from 0.828 to 1.160, according to density. The specific gravity of the Alabama product is considerably greater than 1.000, but I have not determined exactly what it is. In burning it produces a soft, white flame, very similar to that produced by the best refined petroleum. When it is first taken from the deeper strata it is of about the consistency of very thick pitch, but it hardens upon exposure. In its most compact form it presents very nearly the same appearance as a fine quality of cannel coal. In its hardened state it breaks with a smooth, conchoidal fracture, showing a glossy, black surface. I do not doubt that the Alabama deposits will prove to be of great commercial value.

With respect to natural gas, but few efforts have been made in Alabama to secure it. A well was lately bored at Hartzell, twelve miles east of Decatur, in which a small supply of gas was found at the depth of about 1,200 feet. The gas when lighted, burned to the height of five or six feet. At the time of my visit to that region it was still the intention to continue to bore to greater depths, but the drill was then fast in the well, and the work, for the time, was suspended. No records of the strata passed through were kept, but it is rather probable that the flow of gas secured was from the Niagara rocks.

The Macksburg Field in October.

The production of the Macksburg field, estimated from the pipe line runs, the shipments of the West Virginia Transportation Company, etc., averaged about 229 barrels a day for 1884. The gross runs of the Macksburg pipe line since January 1, 1885, with the estimated amount of oil shipped from the field through other channels is given below. The averages represent the best obtainable figures on the production of the field:

1885.	Macksburg P. L. Runs.	Outside Shipments. Est	Daily Average Production.
January	11,894	1500	432
February	20,625	1500	790
March	27,067	1500	922
April	40,527	1500	1400
May	48,258	1500	1605
June	64,982	1500	2,116
July	75,737	1500	2492
August	74,228	1500	2443
September	68,110	1500	2320
October	63,619	7000	2278
November	60,926	7000	2264
December	61,113	7000	2197
Total	617,086	34,500	1785
1886.			
January	54,806	7000	1934
February	49,194	7000	2025
March	58,795	8973	216
April	64,137	7890	2401
May	58,516	660	2104
June	55,379	2871	2275
July	58,410	4081	2016
August	57,492	2790	1945
September	48,918	1240	1672
October	46,937	3240	1619
November	41,359	4690	1515
December	41,578	3040	1407
Total	645,101	53,844	1682
1887.			
January	37,134	450	1343
February	28,514	1200	161
March	32,549	7400	1015
April	29,128	4260	1110
May	2,700	1500	970
June	18,609	3300	1010
July	23,443	3500	880
August	25,710	2760	900
September	22,903	1000	770
October	2,553	3200	800

There were two wells completed in the Macksburg field in October; Boden, Aiken & Payne on the Dyer farm, good for 3 barrels a day and Reeder, Payne & Co. on the A. Dutton farm, a dry hole. No new wells were completed in September or August, and no drilling wells were in progress at the close of October. There are 468 producing wells in the field with an average production of 800 barrels.

The Eureka, W. Va., field has a daily production of ten barrels. One well was finished and two new rigs erected in the month of October.

Wheeling & Lake Erie New Schedule.

Attention is called to the change in the Wheeling & Lake Erie Railway schedule, in effect Oct. 9, 1887. There are few changes in the main line trains, and trains on the Huron Division have been extended to run to and from Monroeville, where connections are made with the Baltimore & Ohio Railroad, which will enable those traveling to and from Milan and Huron to secure increased train facilities to and from points reached by the B. & O. Norwalk people are also accommodated by this service, as it provides two additional trains each way between Norwalk and Monroeville. Two trains each way are now run between Monroeville, Milan and Huron, and three each way between Norwalk and Milan.

THE Pine Run Natural Gas Company has piped all the towns along the Kiskiminetas and Upper Allegheny rivers down as far as Natrona.

ARTICLES of incorporation have been taken out under the laws of Kansas, by the Paola and Kansas City Natural Gas Company. The capital stock of the company is \$1,000,000. It is composed of Kansas City and New York capitalists, among whom are Charles Matt, J. B. Nesbit, James D. Husted, of Wyandotte, and Mr. J. L. White, of New York. The company has purchased the Westfall farm of 322 acres, near Paola, for \$27,500. On this ground are two of the largest gas wells near Paola, and the company intend to bore additional wells, and to lay thirty-six miles of pipe to bring the gas to Kansas City.

THE Home Natural Gas Company, of Brownsville, Pa., has erected a derrick to sink another well on their property. They brought in their second well about two weeks ago, but from reports from the field it is not so large as was expected, and necessitates the drilling of another to insure gas during the winter. The first well was brought in last spring and the company made preparations to pipe Uniontown and adjoining places, but they have about abandoned that project. The well is situated about 1,200 feet from No. 1, and the third will be about 1,000 feet on the other side, near the old mill.

THE experimental gas well of J. M. Guffey & Co., in Indiana township, Allegheny county, Pa., is now 3,000 feet deep and no gas. It will be sunk 300 feet deeper.

PITTSBURGH capitalists have leased 2,500 acres of land in the southern portion of Lawrence county, and are preparing to sink several wells for gas or oil.

A NEW natural gas company has been formed by the citizens of Anderson, Ind., who are dissatisfied with the rates of the McCullough & Foxey Co.

THE North Bucyrus Natural Gas and Oil Co., of North Bucyrus, Ohio, has been incorporated with a capital stock of \$3,000.

THE Surprise Oil and Gas Company, a Cincinnati organization, is drilling for gas near Boston, Ky.

CHARLESTON, S. C., is preparing to test territory for natural gas.

The Increase in the Natural Gas Business.

As an evidence of the great growth of the use of natural gas in Pittsburgh in the past year, the Philadelphia Company officials prepared the following table. It is probable that the other companies will show an equal increase:

Statement showing the number of boilers and furnaces using natural gas in October, 1886, and October, 1887:

	1886.	1887.
Boilers	803	1,164
Puddling furnaces	551	492
Large heating furnaces	439	517
Dwelling houses	4,000	9,000
Cubic feet of gas used in one day in the city	250,000,000	375,000,000
Present capacity of wells		1,200,000,000

The Average Price of Crude.

The following table gives the average price of crude certificates, on the floor of the Bradford Oil Exchange, since March 1, 1879:

MONTH.	1879	1880	1881	1882	1883	1884	1885	1886	1887
January	110 1-5	95	83	92 3/4	111 1/2	70 3/4	88 1/4	71	
February	103 1/4	89 1/4	85 1/4	101	104 3/4	73 3/4	80	63 3/4	
March	86	89	82 3/8	80 3/8	97 1/2	100 3/8	80 3/8	77 1/8	63 1/4
April	78 3/4	76 3/8	84 1/8	78 1/4	92 3/8	91	78 3/8	74	64 1/2
May	73 1/2	80 1/4	81 1/2	70	99 1/4	85 1/2	79 3/8	69 3/8	61
June	63 3/8	100 1/4	81	54 1/2	117 1/4	68 3/4	82 1/4	67	62 3/8
July	69 3/8	101 1/4	76 1/2	57 3/8	108	63 1/2	96 3/8	66	59 1/4
August	67 1/4	03 3/4	78 3/8	58 3/8	108 3/8	81 1-5	100 3/8	62	60
September	69 1/4	9 1/2	92 1/4	71 3/4	112 1/2	78	100 3/8	63 3/8	67
October	88 3/8	96 3/4	92 3/4	93 3/8	111 1/2	71	105 1/2	65 3/8	70 3/8
November	105 3/8	91 1/4	82 3/8	114 3/4	114 4-5	72 1/2	104 3/8	72	
December	113 1/4	92 3/8	83 3/4	95 1/4	114 3/4	74 3/4	89 3/8	71	

THE PETROLEUM AGE,

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THE PRODUCING REGION.

AT THE beginning of October there were 56 new rigs and 21 drilling wells in the New York and Pennsylvania oil region, a total of 77. The number of wells completed in October was 14, with an estimated new production of 576 barrels. The dry holes numbered 29, leaving 85 productive wells, with an average yield of 30 barrels. In September there were 96 productive wells completed, with an average production of $21\frac{3}{4}$ barrels. In August the new producing wells were 115 in number, and they averaged $59\frac{1}{2}$ barrels each. In July there were 127 new wells, and their average output $16\frac{1}{2}$ barrels. In June there were 144 productive wells finished, which averaged 44 barrels each, and the dry holes were 35 in number. The new wells in May averaged 29 barrels, the April 49 barrels, the March wells $42\frac{1}{2}$ barrels, the February wells $65\frac{1}{2}$ barrels, and the January wells 30 barrels each.

The October figures show a decrease of 16 wells completed and an increase of 482 barrels in the new production. In September there was a decrease of 22 wells and of 4753 barrels in the new production, as compared with the figures for August. The August report had a decrease of 10 completed wells and an increase of 4754 barrels in the new production. The July figures showed a decrease of 17 wells and of 4287 barrels new production as compared with the figures for June. June revealed an increase over May of 33 wells and 3198 barrels new production. May had a decrease of 23 wells and of 3056 barrels new production, while April recorded an increase of 36 wells and of 2451 barrels in the new production over March. In October, 1886, there were 79 wells completed, including 6 dry holes, and the new production was 6574 barrels.

Notwithstanding the general anticipation that the approach of the shut-down movement would witness a large decrease in the active operations, at the close of October, the actual figures show a decided gain over those at the close of September. A large proportion of this increase is, of course, to be found in the new section now developing at Saxonburg, in Butler county, but quite a few operators, who are in the producers' movement, are at work finishing up necessary work that was allowed by the terms of the agreement. At the close of October there were 69 new rigs, 113 old rigs and 133 drilling wells in the entire region, a total of 315, as compared with 56 new rigs, 106 old rigs and 121 drilling wells, a total of 283, at the close of September. This is an increase of 20 rigs, old and new, and a gain of 12 in the drilling wells, making a total increase of 32 in active operations over the figures of September 30.

September showed a decline of 6 from the figures for August, and the August figures were 28 less than those of July. July showed a decline of 4 from the June record, while June declined 36 from May and May 7 from

April. April had a decrease of 9 in rigs and drilling wells from the March report, while March showed an increase of 7 in active operations over February, February a decrease of 40 from the January report, January a decrease of 48 from December, and December of 95 from the November figures. At the close of October, 1886, the record showed 142 new rigs, 132 old rigs and 319 drilling wells, a total of 593.

THE ALLEGANY FIELD.

Only three wells were completed in October in the Allegany field, and one of these was a gasser. The new production was but 8 barrels. Six wells were finished in September, three in August and two in July. At the close of the month three new rigs and 27 drilling wells were under way.

THE BRADFORD FIELD.

The monotonous degree of quiet that reigns over the Bradford field, is disturbed here and there by the murmurs of idle men thrown out of employment, by the general shutting in of a part of the production in various sections of the region. Three wells were finished in October, but all were non-producers of oil. The Manufacturers' Gas Co., of Bradford, found a good gas well on the Mack lands, and the Duke Centre Gas Co. met with like success near Rixford. The other dry hole is the test well sunk by a local company near Little Valley, in Cattaraugus county, New York. At the close of October, the report shows 3 new rigs and 6 drilling wells, as compared with 1 new rig and 4 drilling wells at the close of September.

WARREN AND FOREST

There were 38 wells completed in the Middle field in October, including 13 which were either dry or productive of nothing else but gas. The new production was 270 barrels. On the last day of October (this division of the producing region showed 8 new rigs, 26 old rigs, and 22 drilling wells, against 12 old rigs, 29 new rigs and 23 drilling wells on the last day of September.

KINZUA VILLAGE.—The venture of Collins & Phillips, on Warrant 5546, looking for a southwest extension to the prolific pool west of the river, at Kinzua Village, is pronounced a dry hole. With the exception of Fogel & Son, who contemplate drilling another well in the oldest part of the district, all the operators have joined the shut down movement and no more drilling will be done for a twelve month. Two rigs are standing which will remain to represent this section in the monthly report until the reign of enforced quiet is at an end.

At Clarendon and Tiona two wells were under way at the close of the month, which when completed, will be the end of operations in those districts. The Citizens Gas Company of Warren has a rig up on lot 51, which will be drilled in the search for a new source of gas supply for the borough of Warren.

Every producing company at Balltown is in the shut down, with the exception of Welsh, who proposes to prospect on the outlying borders to the southwest at his pleasure. The Grandins have erected a rig on the Cook lands several miles in advance of the Balltown movement, but it will stand untouched for a year.

At Kane, nothing is doing within the proper limits of the oil producing area, and one well is drilling in the gas district. Grand Valley will enjoy a complete shut down before the end of the present month. The National Oil Company complete six wells and hang up the drill for the specified time. A little prospecting is going on along the southwest frontier, but the search for an extension is a seeming hopeless one.

ELK COUNTY, ETC.

All the operators in the Elk County field are in the

shut down movement with the exception of a single firm. The Gillis Farm Oil Company's venture on warrant 1799, the farthest well yet drilled on the east of the field, filled up slowly after a shot and is rated as a small producer. Andrews & Barnsdall completed a couple of good wells on 2020, and the Highland Oil Company one on 2033 in October. The Wilcox Oil Company or Shultz & Co.'s No. 4 on 2676, McKean county, found no oil but was developed into a fair gasser. The National Transit Company is drilling three wells in the gas district. Knox Bros. test at Freeman Station was a failure. The Welsh & Wallace well on tract 2533, Millstone township, Elk county, is a gasser of the first magnitude. J. Wolcott & Co. completed another duster on the Proper lands in Forest county, southeast of Tionesta. The last test of the Shannon Syndicate which is located on 5508, Forest county, is shut down at 1675 feet. Col. John J. Carter is finding some good producers on his extensive purchase of Dr. Shamburg in Harmony township, Forest county; and will close up his drilling list by the first of December. Nothing of any note has been developed about the Kernochan well on the Beaver & Kepler tract northwest of Tionesta.

THE LOWER COUNTRY.

There were 70 wells completed in the Lower Country in October, 12 of which failed to find oil; the new production was 2298 barrels, a decrease of 8 wells and an increase of 592 barrels over the figures for September. On the 31st of October the Lower Country had 57 new rigs, 26 old rigs and 99 drilling wells, as compared with 41 new, 18 old rigs and 86 drilling wells on the 30th of September.

VENANGO.—The shut down movement finds few adherents among the small producers of Venango county. Slab Furnace, the vicinity of Emlenton, Byrom Centre, etc., were not so active in many months as at present. Shamburg and the adjacent sections are growing more quiet, and along the Oil Creek valley very little is being done. Forty wells were completed in Venango county in October against precisely the same number completed in September. The dry holes were 6 in number and the new production only 162 barrels. At the close of October there were 25 new rigs, 9 old rigs and 32 drilling wells in the various sections of Venango county, an increase of 6 new rigs and drilling wells over those at the close of the preceding month.

BUTLER AND ARMSTRONG.

Butler county, or rather one nook in Butler county, furnishes the only problem which perplexes the fine minds who are shaping the shut down movement. The geographical situation at Saxonburg has been outlined in these pages. Bolard, Greenlee & Co.'s first well on the H. Lonitz farm on Thorn creek, about due west of the old town of Saxonburg, started at about 60 barrels and declined to a 15-barrel pumper. The Golden, Wuller & McBride well on the Lonitz farm, about 100 rods southwest of the Pioneer well, made a showing for a large well when first drilled into the sand and has produced as much as 165 barrels in 24 hours. On several occasions the writer gauged the well and found it to be doing 7 barrels an hour. This well stopped flowing on Sunday and was torpedoed with 160 quarts of glycerine at 3 o'clock on Monday afternoon. It started under the stimulating effects of this heavy shot at 30 barrels per hour. Bolard, Greenlee & Co.'s well on the Widow Lonitz farm was drilled into the sand on the morning of October 24, and started on its producing career at the rate of 125 barrels per hour. In the first three hours it averaged 110 barrels per hour. Its gauge Monday morn-

ing, when it was one week old, was 32 barrels per hour. The Troutman Oil Co.'s well on the Adler farm, one location northeast of Bolard, Greenlee & Co. well, was a great disappointment to the owners and to all who watched it drilled into the sand. It failed to respond, and after being torpedoed is only a small producer. On the 5th of the month it was doing 50 barrels per day. Dan Imann & Co.'s well on the northern corner of a four-acre lease about 20 rods southeast of Bolard, Greenlee & Co.'s No. 1 on the Lonitz farm, only had a small amount of good sand which afforded oil. The well is a small one even after being torpedoed, and has caused a half dozen wells to be shut down still farther to the east.

The well of John A. Snee & Co., on the southeastern corner of the Seibert farm, is about 130 rods north of Bolard, Greenlee & Co.'s well on the H. Lonitz farm. It started at 175 barrels per hour, and is by far the finest well struck up to date in the field. The Extension Oil Co.'s well, on the Badenfelder farm, 50 rods southwest of it, is a small producer, after being torpedoed with 130 quarts of glycerine. The Golden, Wuller & McBride well, on the northwestern corner of the Pfabe heirs' farm, is also a small producer. The distance between these two small wells is 80 rods. If one general streak extends to the northeast in the 22½ degree line, it consists of a series of pots of oil.

A few days ago a representative of THE PETROLEUM AGE made the following count of rigs and drilling wells. Ten of the rigs and drilling wells have been shut down or stopped, and probably most of this number will be abandoned.

FARM.	OPERATION.	DEPTH.
Widow Lonitz, Bolard, Greenlee & Co No 2		1000
J H Lonitz,	No 2	17-8
J H Lonitz,	No 3	400
Beauman Heirs,	No 1	1000
Beauman Heirs,	No 2	400
Beauman Heirs,	No 3 (shut down)	300
P. Ohle,	No 1 (shut down)	300
J H Lonitz,	No 1 (shut down)	700
Adler, Urquhart, Lavens & Co No 2		650
Englehart, Urquhart, Lavens & Co No 1		600
Foercht, Urquhart, Lavens & Co No 1		200
Adler, Troutman Oil Co No 2		135
Adler, Troutman Oil Co No 8		750
Badenfelder, Extension Oil Co No 4		100
Aderhold, Clark & Co No 1		1000
Severance, Hayes & Alexander No 1		300
Seibert, John A Snee & Co No 2		200
Beauman, Iman & Co No 2		800
Beauman, Iman & Co No 3		450
Crawford, Haymaker & Co No 1		500
Grabbe, R. R. Armor & Co No 1		550
Welch, R. R. Armor & Co No 1		100
Severance, Marshall Oil Co No 1		250
Severance, Marshall Oil Co No 2		100
Lonitz Heirs, Reiber, Yeagel & Co No 1 (shut down)		350
Aderhold, Golden, Wuller & McBride No 2		1250
Lonitz, Golden, Wuller & McBride No 2		300
P Ohle, Bolard, Greenlee & Co No 2 (stopped)		rig
P Ohle,	No 3 (stopped)	rig
P Ohle,	No 4 (stopped)	rig
P Ohle,	No 5 (stopped)	rig
P Ohle,	No 6 (stopped)	rig
Badenfelder,	No 2 (stopped)	rig
Badenfelder,	No 3	rig bldg
Adler,	No 2	rig
Seibert,	No 1	rig bldg
Adler, Urquhart, Lavens & Co No 3		rig
Foercht, Urquhart, Lavens & Co No 2		rig bldg
Adler, Troutman Oil Co No 4		rig bldg
Badenfelder, Extension Oil Co No 5		rig bldg
"	No 6	rig bldg
"	No 7	rig bldg
"	No 8	rig bldg
"	No 9	rig bldg
Seibert, Snee & Co No 3		rig
Seibert, Snee & Co No 4		rig bldg
Crawford, Haymaker & Co No 2		rig bldg
Frazier, Marshall Oil Co No 1		rig bldg
Badenfelder, Reiber, Yeagel & Co No 1		rig bldg
Badenfelder, Reiber, Yeagel & Co No 2		rig bldg
Graham, Albion & Co No 1		rig
Crawford, Gillespie & Co No 1		rig bldg
Reudert, Staley & Co No 1		rig bldg
Helmhold, B B Campbell No 1		rig
Lonitz, Golden & Co		rig
Adler, Loan & Co		rig bldg
Rigs		23
Drilling		23
Shut down and stopped		10
Total		46

Compared with the figures of the previous week, the

results are exhibited as follows :

Time.	Rigs.	Shut Down and Stopped.	Drilling.	Total.
Nov. 12.....	23	10	23	46
Nov. 5.....	26	--	18	44
Difference ..	3	--	5	2

The production of the Saxonburg field for the twenty-four hours ending on Saturday morning was as follows :

Farm.	Operator	Barrels.
H Lonitz, Bolard, Greenlee & Co No 1		26
Widow Lonitz, " " No 1		240
Adler, " " No 1		103
Badenfelder, " " No 1		408
Beuman, Im .. & Co No 1		54
Aderhold, Go .. n, Waller & McBride No 1		7
Lonitz, " " No 1		144
Pfabe, " " No 1		40
Adler, Troutman Oil Co No 1		20
Badenfelder, Extension Oil Co No 1		600
Adler, Urquhart, Lavens & Co No 1		392
Seibert, John A. Snice & Co No 1		

The twelve wells detailed above were producing 3028 barrels for the 24 hours ending Saturday morning. These wells, when left to themselves after the agitation of the drill has ceased, are not as large as the trade in general credits them with being. Besides they are being so thickly drilled that they cannot become stayers. A majority of the operators who toyed with the fates by drilling in Cherry Grove on five-acre blocks walked out of the country sadder but wiser men. Quite a large number of operators are working the Saxonburg section on a basis of one well to two acres.

WASHINGTON.

The possibilities of the Taylorstown oil field were narrowed down to a considerable extent by the drilling which has been done in the past few weeks. The dry holes on the Work and J. R. McLain farms condemn a great deal of productive territory. For quite a long time the theory of a belt extending in a northwesterly and southeasterly direction had been entertained but the failure of the Ten Mile Oil Company's well on the Work farm will dampen the ardor of explorers for future research in this direction. At this well they struck gas in the stray sand above the regular oil bearing rock in the field. The well of Guffey & Iseman on the John R. McLain farm found gas in the same stray sand above the Gordon rock. It is reported by most parties to have passed below the level of the Gordon sand and to be dry. Mr. Guffey usually makes thorough work of his drilling and when he leaves a well for a failure it is fully sure to be dry. On the first of the month there were three wells under way at Cannonsburg and the one on the Griffin farm has since been drilled to the sand. It showed some oil in the 50-foot sand and later reports said there was salt water mixed with the oil. The outside wild cat wells were unsuccessful at all points. T. J. Vandergrift and G. W. Reed's venture on the Arthur Sprowls farm near Burnstown in the southeastern part of West Finley township was a failure. Isaac Willetts also added another dry hole to the list in the Vanceville section.

Application will be made to the Governor, Nov. 20th, for a charter for the "Blairsville Heat, Light and Power Company." Its object is to supply heat, light and power by means of gas, natural or manufactured, steam, electricity or other means to the public in Blairsville borough and Burrell township, Indiana county, and Derry township, this county. The proposed charter is of the broad-gauge order as it will cover almost anything.—Westmoreland Democrat.

THE gas well near Indiana, Pa., has been abandoned at a depth of 3200 feet. A small amount of gas was found, but not in paying quantities.

THE MANUFACTURERS' GAS CO.

THROUGH the years which go with a rush in an oil town the good people of Bradford have watched the flickering gas-lights on the McKean hillsides dispelling the gloom of night, while in their own homes they were paying more than two prices for the convenient illumination. But a pleasing change has come over the situation, and a new institution has been added to the list of inducements to people to move to and remain in Bradford. On Sunday, October 30th, the new six-inch line of the Manufacturers' Gas Company was completed to Bradford. The scene at the Bradford end of the big gas line on that autumn afternoon is described as follows :

A curious crowd watched Superintendent Markham and a gang of men on the Pike farm, at the head of Congress street, connecting the six-inch main with the three and four-inch branches which join with the different ramifications of pipe throughout the city. The gate on the main failed entirely to shut the gas off on the main line, and the gas which escaped from the end of the six-inch pipe sang a song which fell pleasantly on the ears of the average denizen of the city. Superintendents Markham and Broder, who were on the ground, said that the two parties who were laying the main line met near Tally-Ho pump station on Friday, October 28th, and that the last joint of the main pipe was laid at one o'clock on the following morning by the light of a bonfire. The line was put to a satisfactory test and the gentlemen in charge said they were satisfied that it was free from obstructions. The gas was turned on at 3 o'clock on Sunday afternoon, and the pressure at the Bradford end of the line, which is about twenty-three miles from the wells, at 6 p. m. was fully 600 pounds to the square inch. The main line is tested to withstand a pressure of 1,500 pounds to the square inch and the average working pressure will be kept below 200 pounds. A regulating house has been erected on the Pike farm at the terminus of the main, where already "mechanical devices" for safety have been placed in position. The pressure on the line for the domestic supply will not exceed a half pound to the square inch, while that for the manufacturing interests will be maintained at forty pounds. The Manufacturers' Gas Company has a large gas area which the believe will be ample to meet the demands of the future. At the present time they have two wells, the McNulty well on lot 343, and one purchased from Frank W. Andrews, on warrant 3,132. From the present southern terminus the line will be extended to the gas territory owned by the company on warrants 3,771 and 3,779.

The officers of the Manufacturers' Gas Company are as follows : President, T. N. Barnsdall ; Vice-President, J. L. Seyfang ; Secretary and Treasurer, A. W. Lewis. It took forty-six days from the time the work was begun to complete the main line and pipe the city, and this Mr. Lewis said was beating the record for rapid work at all points that he had heard from.

The Manufacturers' has lately struck a big gasser on warrant 3,908, up the West Branch. While the gas from the shallow sand of the West Branch is of inferior quality, it can be used for boilers and manufacturing establishments.

The pipe was furnished by the Chester Tube and Iron Co. Messrs. Kelley & Sheehan had the contract for laying the main line, and McMahon Bros. hurried the work of excavating the trenches in the city.

PETROLEUM IN WYOMING.

PROFESSOR RICKETTS, the Territorial Geologist of Wyoming, has recently completed an extended examination of the Rattlesnake, Beaver and Little PopoAgie oil districts of Wyoming. In an interview by a reporter of the *Wind River Mountaineer*, he gave the following account of his researches and partial result of the same. Making his headquarters for some time at Ervay's ranch in the Rattlesnake fields, Prof. Ricketts scoured the country from the Goose Egg Cattle ranch to Beaver creek. On every hand he found oil springs, oil seepage, and oil saturated rock. About Ervay's the oil is illuminating, and of the first quality. One great use of this oil in the near future will be as a light-house and headlight oil.

The great lubricating spring at the head of Poison Spider is in itself an almost limitless oil supply. This oil is of the heaviest quality, and will make, in addition to its other valuable uses, a magnificent fuel. All through the Poison Spider region, as in the Ervay section, is found the oil saturated sandstone, the most certain oil indication known.

Where Wallace, Graff, Lovett, Murphy and Rogers creeks cut through the heavy bluffs and divides branching from Garfield Peak are numerous oil springs and escapes. Each one of these creeks is in itself a veritable oil bonanza. All of the creeks named lie between Ervay's and the head of Poison Spider, and in addition to the oil richness of their own beds mark a region nearly every acre of which bears evidence of an oil deposit.

Beyond Ervay's the Dutton basin is covered with oil saturated sandstone. At two points is this basin shafts have been sunk, and fine oil escapes tapped. In the same basin natural gas has also been struck with the most promising indications of large deposits.

In the Beaver fields Prof. Ricketts had the pleasure of examining in its native home the famous article which has been pronounced by London chemists to be the finest natural lubricating oil in the world.

Prof. Ricketts has also examined the Little PopoAgie oil with the happiest results. He says "that in ten years Wyoming will occupy the position in the oil market now held by Pennsylvania." The Professor coincides fully in the opinion so generally expressed of late that the Pennsylvania fields are rapidly going by the board. He also confirms the newspaper statements in regard to the great difficulty of refining the oil of the Ohio fields. To use the Professor's pertinent and vigorous expression: "The smell of the Ohio oil is simply atrocious."

One valuable peculiarity of the oil fields thus examined by Prof. Ricketts is the immense deposits of hardened oil. This is spread over acres upon acres, to a depth of from 3 to 6 feet, and consists of all those oil ingredients sufficiently heavy to resist evaporation. Thousands of tons of this hardened oil can be gathered up, and as a fuel it has no rival.

In speaking of the evaporation of the lighter oil ingredients resulting in formation of the hardened oil above referred to, Prof. Ricketts said that owing to evaporation all surface oil was necessarily of much less value than oil of the same quality beneath the surface, and that this fact was of the utmost importance in estimating the value of an indicated oil deposit.

Ten miles on the other side of the mountain divide between the Lost Cabin and the Nowood regions, Prof. Ricketts encountered the bright colored sandstone known geologically as red triassic. This deposit, in

varying thickness, extended down the slope of the great divide clear to Paint Rock creek, underlaid all the way by a heavy white sandstone. No oil indications whatever were found in this red and white sandstone.

The main wagon road of the section was then followed down Paint Rock creek to the point of its intersection with Nowood. At this point the Nowood flows over the Foxhill sandstone and the Benton shales, and the oil was not far distant. The rock on either side of the Nowood dips towards the stream, and an upward tracing speedily led to the blue color of the Benton shales.

The oil had now been scientifically traced and was found where pointed the scientific geologist's finger. On the anticlinal west of the Nowood, and one-half mile from the stream, was the Bonanza spring itself. Here in a gulch, the bottom of which was formed of Benton shales, are the two pits sunk by A. A. Conant. These pits are one hundred yards apart, and the soil surface between them is completely saturated with oil. These pits will fill every twenty-four hours with water, on whose respective surfaces will float two gallons of oil. This oil is thin, and by transmitted light is cherry red, and by reflected light shows a dark green.

Prof. Ricketts made no test of this oil himself, but from tests made by others, the results of which were shown him, is fully satisfied of its excellence. It shows 35 per cent. of illuminating oil, very little paraffine, a small amount of coke, and 55 per cent. of lubricating oil, mingled with illuminating oil of extremely high test, such as is used in lighting Pullman cars.

For a distance of five miles the anticlinal abounds in oil indications of the finest character, and Territorial Geologist Ricketts says that a railroad is all that is needed to make the Bonanza fields a great oil factor.

The Shut Down.

On the last day of October the Executive Board of the Petroleum Producers' Association and the Advisory Board met at Oil City and signed the contract by which a part of the daily production is to be shut in for one year. Taking the average daily pipe line runs for the months of July and August each man signing the contract is to reduce his production a certain proportion from the average for those two months usually from one-third to one-half. From this shut in producers are to receive the benefit which may accrue from the advance in the price of 5,000,000 barrels of oil which have been set aside at 62 cents per barrel. The profit on the oil is to be divided on the pro rata plan or proportionally to the amount of production which each man shuts in. Out of the 5,000,000 producers give the profit on 1,000,000 to laboring men and the Standard sets aside 1,000,000 for the same purpose. A great many producers have also agreed not to drill any more wells for one year. All branches of the trade except the bears see the necessity of wiping out a portion of the stocks and thus lightening the burden of carrying oil. The men who are at the head of the movement will be obliged to keep it in good faith to secure the profit which will come from an advance in the price of oil.

SPECIAL attention is directed to the new advertisement of the Ridgway Publishing Company Limited, in this issue. County officers and lawyers would do well to write for a catalogue of their law blanks.

THE "largest" gas well was again struck in the Murphysville field, on Saturday, on the farm of J. H. Hamilton two miles north of that place. It is said to be a tremendous roarer, with a pressure which lifted the tools, rope, etc., weighing almost two tons.

CARING FOR THE PUMPERS.

DIFFERENT operators are adopting different methods of satisfying the men who are thrown out of employment by the shut down movement. Some who are well-to-do are keeping the men at full pay and the men are putting in their time fixing up the old derricks and steam boxes on the properties. One firm makes a satisfactory arrangement by letting the single men go and keeping the married men at full pay. The contract which Whitney & Wheeler have offered to make with their men is as follows:

WHEREAS, Whitney & Wheeler have determined to curtail certain of their operations in the production of oil, and to obviate the necessity of throwing out of employment any of their men by discharging the same, we have determined upon the following plan:

Therefore, It is agreed between the said Whitney & Wheeler and....., one of their employees, that the said.....may continue in the employ of the said Whitney & Wheeler at the same salary as heretofore paid him, on the following conditions, to-wit: Two-thirds of his monthly wages shall be paid as heretofore on the regular pay days, thereafter from the first day of November, 1887, to the first day of November, 1888. The wages hereby agreed upon at the rate of \$.... per month. The arrears of wages that may be due..... on November 1, 1888, shall be divided into three (3) equal payments, one (1) of which shall be paid on every monthly pay day thereafter, commencing on December pay day, 1888, and continuing until all is paid. It is expressly agreed that nothing herein shall vary or change the present terms of hiring between said Whitney & Wheeler and....., except as to terms of payment as hereinbefore provided.

It is still further agreed that said.....shall devote his entire time for the said Whitney & Wheeler at such work as they, the said Whitney & Wheeler, or their representative, may require while in their employ, whether in the direct line of present employment or outside thereof.

It is still further agreed that the said Whitney & Wheeler reserves the right to discharge the said..... at any time, and the said.....reserves the right to quit the employment of the said Whitney & Wheeler at any time. But it is mutually understood between the parties hereto that none of the deferred wages earned between November 1, 1887, and November 1, 1888, shall become due and payable otherwise than hereinbefore provided.

Nothing herein shall be construed as an agreement between the parties hereto, as furnishing employment for a year or any part thereof, but the hiring shall be monthly as heretofore.

WITNESS the hands and seals of said parties this....day of....., 1887.

.....(L.S.)
.....(L.S.)

Col. John J. Carter's contract is much the same as the above, only he retains one-half of the pay of the men until the end of the year.

The producers having organized to protect their interests, there is a move on foot among the pumpers to form a Union of some kind so they can negotiate as a body with existing organizations in the country. On the afternoon of November 12th about 75 oil well workers met at Newell's Hall in Bradford, in answer to a call which was published in the Bradford papers by parties outside of the guild of pumpers. It was the sentiment of many of those present that they should become a part the K. of L. organization. A committee of ten appointed by the Chairman, Mr. John Kirk, of Lafayette, presented the following paper for signatures:

We, the undersigned, hereby agree to become members of the Oil Well Workers' Association, and bind ourselves to be governed by the constitution and by-laws to be adopted by this Association hereafter, and bear our

part of the expenses incurred by the Association in furthering the objects of the same.

Of the number who were present when the paper was passed around the hall, twenty-nine signed the paper, and it was the sense of the meeting that the names be not published.

A committee of five was appointed to meet at the Riddell House on Tuesday afternoon at 2 o'clock, to consider the best plan of an organization. It consists of M. J. McGuet, Chairman; J. H. Litzenburg, J. N. Teitsworth, C. E. Huntington and James McGray.

The pumpers adjourned for one week and will be on tour at Newell's Hall at 2 p. m. Saturday, Nov. 19th.

Oil Dealers Circular.

[The following circular, with the names appended, issued nearly sixteen years ago, will be of interest to the signers and to the trade as one of the many steps taken to regulate the buying and selling of our product. A few of the parties have gone over the Silent River, but the great majority are still prominent and active in the oil business in various ways.]

"We, the undersigned, dealers, refiners, producers and brokers, do hereby agree that on and after the 1st day of January, 1872, we will not buy or sell crude or refined petroleum after 7 o'clock p. m.; that is, to make a business of so doing. As dealers and refiners we will not keep an office where it shall be understood we will remain during the evening, for the purpose of buying or selling, or go to any place of resort, oil exchange, telegraph office, etc., for that purpose; but claim the right of buying or selling when meeting a customer incidentally, or as an accommodation. As producers, we will not make a practice of selling petroleum in the evening, but endeavor to close our trades before 7 p. m. As brokers, we will not buy or sell, or endeavor to do so by using the telegraph, or otherwise, after 7 p. m.

Joseph Seep,	J. Foster Clark,
A. P. Bennett,	Joseph Bushnell,
John W. Alexander,	A. L. Woolsey,
T. W. Larsen,	Johnston & Sowers,
J. D. Sterrett,	L. H. Severance,
R. Henry Lee,	Josiah Lombard,
Vandergrift & Co.,	D. H. Cady,
S. W. Blakesley,	W. W. Thompson,
H. L. Taylor,	W. H. Abbott,
H. Boyer,	F. W. Ames,
Paul W. Garfield,	H. R. Williams,
James S. Lowe,	James F. Hughes,
Jack Lowe & Co.,	H. C. Bordwell,
Geo. A. Ball,	J. D. Thompson,
J. W. Butters,	E. G. Patterson,
David Emery,	D. J. Thayer,
R. W. Evans,	Easterly & Davis,
S. G. Emery,	H. W. Fancett,
Pickering, Chambers & Co.,	Johnson, Perry & Co.,
James A. Wing,	Lyman Stewart,
Hinckley & Allen,	T. & P. Griffith,
	S. R. Hatton.

MIDDLETOWN, N. Y., Oct. 27.—Recently a number of Norwich capitalists organized a company for exploring for natural gas and petroleum in the vicinity of that town, and boring was commenced in a ravine near by. Yesterday, when the drill had been driven to the depth of 700 feet, a pocket of natural gas was struck, the gas flowing from the mouth of the well in considerable volume. The escaping gas was lighted and burned brilliantly for several hours. The encouraging development has elated the stockholders of the company, and caused much excitement throughout the upper Chenango Valley.

A GEOLOGICAL OPINION.

PROF. LESLEY ON OIL AND GAS IN CAMBRIA COUNTY.

C. L. Jones, of Johnstown, a practical driller of sixteen years' experience, has made public an interesting letter received by him from J. P. Lesley, State Geologist, on the subject of oil and gas. It contains so much information, and so many good suggestions, that the letter is reproduced at length:

DEAR SIR:—It is my official duty to furnish any geological knowledge I have freely to any citizen of Pennsylvania, and I am always pleased to do it. But there are points of geological *fact*, (not *principles*) concealed from us all; and you are aware that the *actual existence* of petroleum and gas under any given farm or township is one of them. In the disturbed country east of the Alleghenies no experienced geologist will hesitate to affirm as certain that none will ever be found. But in the undisturbed region west of the Allegheny mountains a geologist would act rashly to express any such confident opinion. There may be places in the counties you mention (Somerset and Cambria) where oil and gas exist; but, as yet, we have not the slightest evidence of the fact—I mean the fact of their existence *in any such quantities as would pay for boring for them*. As a geologist I should not risk my money in boring for them. On the other hand, I should be very glad—and I should encourage *rich* men, or companies *with a surplus* of money, to bore very deep wells in those counties, for the sake of obtaining information. If I were a Napoleonic dictator of Pennsylvania, I should spend *several million dollars* of the State's revenue in *systematic* boring all along the first and second bituminous basins, *to enlarge useful knowledge*. But I should discourage with all my might individuals of small means from boring at all in them, except for *coal beds*. And for this purpose I should advise them to club together, in "boring associations," to bore along the entire lines of the sub-basins, i. e., along the *synclinal lines*; especially for the coal bed next above the Conglomerate. I think a line of holes a *mile apart*, for fifty miles, would be one of the most *practically useful* things that the people of those counties could undertake.

In Cambria county, for example, such a line of bore holes, properly watched, measured and sampled by expert geologists appointed to do this while the tools were going down, would lay a solid foundation for the future wealth of the county, which would have the highest value. Experience has proved that the well-borers, who work by contract to reach a depth named in the contract, and therefore hurry down the bore hole as fast as they can, and pay little or no regard to anything they pass through until they have nearly reached the required depth, are not to be expected to furnish any useful practical information to the public. They are not to be blamed for this, for they have their living to get and their families to support, and they cannot afford to lose their time and money in constant measurements, samplings, and careful records of all the strata they pass through. This must be done by somebody else who is specially paid for this particular duty.

Until a large number of borings are done *in this fashion*, our geology will remain very uncertain and obscure, in spite of the amount of expensive prospecting which is done all time along the outcrops.

Two wells (for example) at Dawson's mill (Cambria mills) three miles northwest of Gallitzin, were bored for oil twenty-four years ago, nearly along the centre line

of the first sub-basin, and are said to have struck (one of them) a 7-foot coal bed, (coal A) somewhere between 300 and 400 feet down; but no records exist of either of the wells, although one went down 920 feet and was abandoned. Had *proper* record of these two wells been taken they would be enormously valuable for settling the number and the character of the coals between the Conglomerate and Mahoning (the Clearfield coal measures,) which have been grossly misrepresented by the prospectors along the outcrops. No oil or gas were got in these wells; but then 920 feet would not reach the Venango oil sands, at this point, nor anything like reach them; for they must lie at a depth beneath Cambria mills of at least 2000 feet and perhaps as much as 4500 feet; owing to the thickening of formations of XI, X and IX (under the Conglomerate) going east. The Conglomerates at the bottom of IX which seem to represent the Venango oil sands, lie in Huntingdon county (Broad Top) more than 6000 feet beneath the Mahoning sandstone of Cambria county.

Your opinion that oil and gas will not be found in the first bituminous coal basin back of the Allegheny mountains in Clearfield, Cambria and Somerset is a sound one; because even if the oil sands exist there, they probably do not hold oil, and very little, if any gas; and especially because they lie certainly more than twice, probably three times, as far down in the series, as they do in the oil regions proper.

The same is true (to a less extent) in the second (Ligonier) basin in Clearfield, Indiana, Westmoreland and Fayette. In this basin they lie at least twice as deep as in the oil regions, that is, twice as far beneath the Ferriferous limestone, or rather, beneath the Conglomerate, for the Ferriferous limestone was not deposited southeast of Indiana county. Yours respectfully,

J. P. LESLEY.

Mr. John Fertig Exonerated.

On Monday, Nov. 12th, United States Commissioner Frank S. Grant, of Erie, dismissed the case in which Hon. John Fertig, of Titusville, was charged with perjury. Concerning the case the Erie Morning Dispatch says:

Monday United States Commissioner Grant rendered decision in the case against Hon. John Fertig, of Titusville, charged with perjury alleged to have been committed in an equity proceeding in the U. S. Circuit Court in Ohio, in which Fertig and others were plaintiffs and Laing and others were defendants. In this case the defendant is discharged on the ground that his testimony in the equity case which constituted the alleged perjury was not material to the issue on trial there, and therefore, even if false, would not constitute perjury. The documents in the case were voluminous and their consideration has necessarily taken time and involved no little labor. The Commissioner's opinion is very briefly but comprehensively stated.

A Railroad Sued.

On October 26th the Philadelphia refining firm of Logan, Emery & Weaver, commenced suit in the McKean county courts against the Pennsylvania Railroad for rebates and drawbacks, in the sum of \$321,000, being treble damages on a claim of \$107,000. The plaintiffs allege that the Railroad Company has injured their business by unjust discrimination in the matter of furnishing oil tank cars, and bring the suit under the Inter-State Commerce Act. The plaintiffs' attorneys are Messrs. Lee, Hastings & Criswell and Elliott, Jack & Roberts, of Bradford, and Roger Sherman, Esq., of Titusville.

Practical Works on Oil and Gas.

A PRACTICAL TREATISE ON PETROLEUM—Comprising its origin, geology, geographical distribution, history, chemistry, mining, technology, uses and transportation, together with a description of gas wells, the application of gas as fuel, etc., by Benjamin J. Crew; with an appendix on the Product and Exhaustion of the Oil Regions and the Geology of Natural Gas in Pennsylvania and New York, by Charles A. Ashburner, M. S. C. E., Geologist in charge Pennsylvania Survey, Philadelphia. Illustrated by 70 engravings and 2 plates. In one volume, 8vo, 508 pages, price \$4.50. Sent by mail, free of postage, to any address in the world, by THE PETROLEUM AGE, Bradford, Pa.

NATURAL GAS AND PETROLEUM.—Preliminary Report on Petroleum and Inflammable Gas in Ohio. By Professor Edward Orton, State Geologist.

This is the only volume which treats at length of the new horizon of gas and oil in Ohio and Indiana, viz.: the Trenton Limestone. The conditions under which gas and oil are found under this rock, the districts within which they can be looked for with most promise of success, and the reasons for failure or success in particular districts are pointed out. The most practical modes of measuring the flow of gas wells ever published are described in this volume. Price, bound in paper, \$1.00; bound in cloth, \$1.25. Sent postpaid to any address on receipt of price. Address THE PETROLEUM AGE, Bradford, Pa.

GEOLOGIC DISTRIBUTION OF NATURAL GAS.—The Geological Distribution of Natural Gas in the United States. By Charles A. Ashburner, C. E. Geologist in charge, Pennsylvania Survey, with an Appendix Relating to the Composition and Fuel Value of Natural Gas and the Extent of the Natural Gas Business in the Vicinity of Pittsburgh. Illuminated cover, 5 maps and geological sections. 8vo, paper cover; price, 40 cents.

This is a most complete statement relative to the Geologic Distribution of Natural Gas in the United States, prepared by one of our leading geologists, whose position as Geologist in charge Pennsylvania Survey, has given him unusual facilities for obtaining information relative to this subject. Some exceedingly valuable maps and sections, and a chart showing the divisions and thicknesses of the rocks of the Palæozoic System in New York, Pennsylvania and Ohio accompany the paper.

THE GEOLOGY OF NATURAL GAS.—The Geology of Natural Gas in Pennsylvania and New York. By Chas. A. Ashburner, Geologist in charge, Pennsylvania Survey, Philadelphia. Paper cover; 15 cents.

This is a paper read by Mr Ashburner before the American Institute of Mining Engineers at the Halifax meeting in September, 1885. It attracted no little attention at the time of its publication, and is still of great value to all interested in the occurrence of natural gas.

SOMETHING ABOUT NATURAL GAS.—Something About Natural Gas—Its Origin, Extent and Development—The Piping Systems, Safety Appliances and Devices for its Safe and Economic Utilization—Gas the Fuel of the Future. By Lemuel Bannister. Illuminated cover, small 4to. Paper cover, 25 cents.

The character of this little work is best shown by the following table of contents: Natural Gas and Its Development—Probable Extent and Permanency of Supply—Ashburner's, Orton's, McMillin's, Lesley's and Carll's Opinion as to Origin and Exhaustibility—The Problem Which Natural Gas Presented—The Piping System—Testing Pipes and Joints in the Trench—Safety Appliances—Detecting and Locating Leaks—The Automatic

Pressure Regulator—The Automatic Shut-off Valve—The Automatic Temperature Regulator—Solution of the Problem Complete—The Duty of Municipal Corporations—Appendix—Analysis of Natural Gas—Illuminating Gas—Consumption.

For copies of the above address THE PETROLEUM AGE, Bradford, Pa.

The Foster Brook Valley After the Shut Down—The Festive Pumper.

On the afternoon of November 2d a representative of the PETROLEUM AGE visited the Foster Brook valley. On that day the rugged hillsides in their russet autumn robes presented a scene in striking contrast to the moving panorama which animated the valley in days of yore. There was a stillness and quiet about the field which was almost painful to one who has always had the creaking of the walking beam for a lullaby in his saunterings among the wells. From the head of the valley to its mouth the walking beams were found pointing skywards, with the exception of those on two properties at Red Rock, where the operators, Wysbrod, who has 36 wells, and H. A. Canfield, who has 10, have decided not to shut in their production. In the whole length of the valley, so far as could be learned, only three pumpers had retired from the labor corps. Throughout the northern field in all the small towns outside of Bradford the shut down and how it will affect the workingmen, is the topic of the hour. The pumper, who has learned to scale the lofty derrick with the agility of a sailor climbing the mast, who has watched the walking beam through the long hours of the passing years, leaves his rudely fashioned chair with a pang of regret. The creaking of the walking beam long since found an echo in his heart, and the loneliness which steals over him as he goes out from the shadows of the tall derricks to return no more for twelve long months is only surpassed by that which surrounds the traveler on the boundless prairies or the silent wastes of the Sahara. In this sordid work-a-day world let the large operator mingle a little sentiment with the business of a mercantile age. The men at the wells in the country are a reading, thinking class with an average of intelligence far above that found among working men in other lines of toil. From a few sources there have come mutterings of discontent because the situation has not been made plain when they were set adrift on account of the shut-in. Every operator should take the pains to explain to the men whom it is necessary to retire the facts concerning the 2,000,000 barrels of oil which has been set aside for benefit. As the writer understands the arrangement it is as follows: The Standard Oil Company and the producers have jointly set aside 2,000,000 barrels of oil, purchased at 63 cents per barrel, for the benefit of the workingmen. Whatever profit may accrue on this oil during the year will be distributed fairly among the men who are thrown out of employment, partially or wholly, by the shut down movement. Just how this will be done has not been decided as yet by those in authority, but the men in the movement who insisted on having the workingmen taken care of are incapable of doing anything that is unfair or ignoble.

ZANESVILLE, O., Oct. 27.—The City Council last night ordered a special election to permit the Southeast Natural Gas Company to lay mains in the city streets. The Southeastern is a company organized some months ago, incorporated by T. E. Richards, J. Burgess, Robert Silvey, Thos. Drake and Wm. Carr. They have been drilling at various places about the city, and have struck a gusher somewhere near, but refuse to tell just where.

October Production Report.

Reports of stocks at wells received by THE PETROLEUM AGE show an average decrease of 8.85 barrels to the well in the Bradford and a decrease of 2.4 barrels to the well in the Allegany field during the month of October. The total number of wells connected with the pipe lines October 1st was estimated at 14,100 in the Bradford and 4000 in the Allegany field. Taking the above figures as the basis of an estimate on the daily production, stocks in tanks at wells were decreased at the rate of 4025 barrels a day in the Bradford field and 312 barrels per day in the Allegany field, a total daily reduction of 4,337 barrels. The total daily runs in both fields averaged about 26,765 barrels a day in October. Subtracting the reduction in stocks, the Bradford and Allegany production averaged 22,428 barrels a day in October, which may be placed at 3,100 barrels a day for the Allegany and 19,328 barrels a day for the Bradford field.

THE SEPTEMBER REPORT.

Reports of stocks at wells received by THE PETROLEUM AGE show an average decrease of 3.8 barrels to the well in the Bradford and an increase of 1.1 barrels to the well in the Allegany field during the month of September. The total number of wells connected with the pipe lines October 1st was estimated at 14,100 in the Bradford and 4000 in the Allegany field. Taking the above figures as the basis of an estimate on the daily production, stocks in tanks at wells were decreased at the rate of 1539 barrels a day in the Bradford and Allegany fields. The total daily runs in both fields averaged 25,655 barrels a day in September. Subtracting the reduction in stocks, the Bradford and Allegany production averaged 24,116 barrels a day in September, which may be placed at 3,300 barrels a day for the Allegany and 20,816 barrels a day for the Bradford field.

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

Field.	No. Wells		Average	
	Oct. 1.	Nov. 1.	per well Oct. 1.	per well Nov. 1.
Clarendon and Tiona	106	106	24	20
Cherry Grove	22	22	33	38
Cooper District	130	130	31	24
Lower Country	222	222	78	69
Miscellaneous	225	231	64	37

Accepting the outside runs, which are made up of the producing fields outside of Bradford and Allegany, as representing the production outside of those two fields, an estimate on the yield for October and September is as follows:

Field.	October. Barrels.	Sept'm'r. Barrels.
Bradford	19,328	20,806
Allegany	3,100	3,300
Outside Runs	35,714	36,029
Total	58,142	60,145
Macksburg	890	770
Total with Macksburg	58,942	60,915
Decrease per diem	1,973	-

This represents a decrease in production of 18,067 barrels per day when compared with the figures for October, 1886.

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region. The Lima runs by the Buckeye Pipe Lines were 14,353 barrels a day in October, 15,525 barrels a day in September, 15,834 barrels a day in August, 12,580 barrels a day in July,

15,818 barrels in June, 14,486 barrels in May, 11,760 barrels in April, 9777 barrels in March, 7394 barrels in February, and 4226 barrels in January.

The following table shows the comparative production for 1884, 1885, 1886 and 1887:

	Bradford.		Allegany.		Outside Runs.		Total Prod.	
	1885.	1884.	1885.	1884.	1885.	1884.	1885.	1884.
January	28,675	31,806	8,260	11,264	18,594	16,140	55,529	59,240
February	27,051	32,375	7,196	11,607	19,800	18,561	54,047	62,546
March	26,444	31,912	7,342	11,768	19,923	19,764	53,709	63,444
April	27,413	32,442	7,169	11,848	23,067	19,162	57,649	63,452
May	27,231	33,922	7,049	11,547	21,225	19,549	55,505	65,018
June	29,272	33,753	7,463	11,108	21,559	19,977	58,294	64,838
July	30,309	34,031	7,139	11,218	19,273	21,870	56,721	66,119
August	29,858	33,333	7,065	10,384	18,608	22,830	55,531	65,567
September	30,205	32,976	7,186	9,877	21,269	22,514	58,660	63,367
October	30,180	31,758	6,747	9,356	23,161	22,762	60,088	63,876
November	31,355	31,789	7,002	8,642	23,087	23,557	61,444	63,988
December	29,223	29,116	6,196	8,193	24,184	22,918	59,603	60,297

	1886.	1885.	1886.	1885.	1886.	1885.	1886.	1885.
January	28,677	28,675	6,378	8,260	22,217	18,594	57,272	55,529
February	27,051	27,051	6,651	7,196	22,603	19,800	57,840	54,047
March	27,947	26,444	6,137	7,342	25,680	19,923	59,764	53,709
April	27,807	27,413	6,527	7,169	28,693	23,067	63,027	57,649
May	27,148	27,231	6,535	7,049	34,515	21,225	68,198	55,505
June	27,860	29,272	6,554	7,463	40,040	21,559	74,454	58,294
July	27,046	30,309	6,350	7,139	40,491	19,273	73,887	56,721
August	26,695	29,858	6,200	7,065	43,762	22,830	76,657	55,531
September	26,674	30,205	5,994	7,186	45,560	21,269	78,228	58,660
October	25,454	30,180	6,017	6,747	45,538	23,161	77,009	60,088
November	24,503	31,355	5,860	7,002	40,817	23,087	71,180	61,444
December	22,422	29,223	5,178	6,196	38,783	24,184	66,383	59,603

	1887.	1886.	1887.	1886.	1887.	1886.	1887.	1886.
January	23,269	28,677	5,563	6,378	34,254	22,217	63,086	57,272
February	22,930	28,586	5,049	6,651	35,745	22,603	63,724	57,840
March	22,327	27,947	4,937	6,137	36,135	25,680	63,392	59,764
April	21,880	27,807	4,447	6,137	37,120	28,693	63,447	63,027
May	21,995	27,148	4,500	6,535	36,758	34,515	63,233	68,198
June	22,000	27,860	4,337	6,554	35,938	40,040	62,275	74,454
July	21,500	27,046	4,000	6,350	34,505	40,491	60,065	73,887
August	21,500	26,695	3,895	6,200	33,726	43,762	59,121	76,657
September	20,816	26,674	3,300	5,994	36,029	45,560	60,145	78,228
October	19,328	25,454	3,100	6,747	35,714	23,161	58,942	60,088

The Refined Market.

A glance at the record of the refined quotations for the month of October shows that the figures were marked up several notches during the last half of the month. The correspondent of a New York journal says of the refined market on November 1st: Refined in barrels for export has been in steady request, shippers placing their orders freely, and they have been encouraged to do so by reason of the more favorable freight rates prevailing. While there has been no change in price, 6½c being maintained for 70° Abel test for all loadings, there has been an impression prevailed that the price would be advanced as it was believed that the speculative market for certificates would experience a boom in anticipation of, or immediately following the inauguration of the shut down movement, and in anticipation of this, liberal orders have been placed. The sales for the week do not fall much short of 200,000 barrels and there is still a good demand notwithstanding that the stocks abroad show an increase. The Continental markets are somewhat easier but at London an advance has been gained. Freight rates are easier and charters have been effected at slightly lower rates. Hence to London is 11½d@2s is the rate, while to Continental ports the range is 2s@2s 6d as to port, with some vessels to be had under to best ports. Home trade lots have been moderately active and have ruled firm. We quote 8¼@8½c for State legal test, 7@7¼c for 110 test; 7¼@7½c for 120 test, 7½@7¾c for New York City 100° flash, and 8½@8¾c for New York City 150° water white. Western lots are now held fully up to these figures, but no important offerings are reported.

Cases for export have again received less attention, and only urgent orders have been placed, the total sales amounting to about 150,000, notwithstanding that the price has been reduced to 8¾c for plain tops. Freight rates are nominally unchanged: The rates for large vessels are: For Java, 24@24½c; Japan, 22@23c; Calcutta, 19@20c; Bombay, 19c; Rangoon, 20c; Singapore,

21@22c; Hong Kong, 21@22c, and for Shanghai 27@28c.

Crude in barrels for export has received little attention sales of only about 25,000 barrels being reported. Prices have remained steady at 6½@6¾c on Friday for Bradford and Parker respectively. Cases have been in light request for export with sales of only 20,000 reported. The prices steady at 7½@8c.

The exports of refined, crude and naphtha, from all ports, from January 1 to November 5 have been as follows:

	1887. Gallons.	1886. Gallons.
From Boston.....	3,621,727	5,083,332
Philadelphia.....	141,773,875	130,470,249
Baltimore.....	6,897,711	13,381,229
Perth Aboy.....	11,462,129	5,250,603
Total.....	166,788,472	151,188,413
From New York.....	319,521,559	334,280,010

Total exports from United States. 486,279,022 485,468,413

In glancing over the figures in the shipping list showing the exports of petroleum to the points along the Blue Mediterranean and other ports which can be reached conveniently from the Russian field, it will be seen that less oil has been exported to them up to the present writing than was for the same time last year.

William H. Samuel & Co., of Liverpool, England, report the visible supply of refined petroleum on October 1st as follows:

	Barrels.
Europe (7 Continental ports)	1,602,164
London.....	290,181
Liverpool.....	130,000
Total.....	2,022,345

The same parties under that date say of the present position and future outlook:

The further advance in prices foreshadowed in our last monthly Circular has since taken place, and there is now every indication that a higher range of prices will be established and maintained for some months to come. The position at present presents quite a new and remarkable aspect, owing to the large development in the demand for Russian oil, the highly satisfactory quality of the greater portion of which, is being so fully recognized that it is in many quarters ousting American oil from the field. The demand has indeed been so large that the Russian refiners have advanced their prices to the extent of nearly ½d. per gallon, and now that the trade are coming to recognize the real value of good Russian oil, there is no reason why the best brands should not command within ¼d. per gallon of the price of "Royal Daylight."

The firmness displayed by the American markets last month has been more than maintained. Although crude oil, after advancing quickly to as high as 75 cents per barrel, as quickly receded to 62 cents, it has since steadily but more surely advanced to 73 cents, closing therewith yesterday. Refined oil, too, has advanced from 6½c to 6¾c per gallon, and the advance in c. i. f. quotations has increased equivalent to nearly ½d. per gallon. The upward tendency of the primary markets has had a like effect upon home markets, and prices in Liverpool have advanced ¼d. to ½d. per gallon. The supply; however, is larger than at same time last year, and the prices that ruled during the most important part of last season, can therefore hardly be expected to be touched, but there is every likelihood of the recent advance being improved upon and maintained. It is a remarkable fact, notwithstanding the large increase in the consumption of Russian oil, the exports of refined petroleum from America to Europe, from January 1st to September 30th, have been over 10 per cent. in excess of the exports during same period last year.

Mr. George H. Lincoln's monthly circular gives the

following figures on the clearances of refined petroleum, in cases, for China and the East up to the 31st of October, for the years 1886 and 1887:

	1887. Cases.	1886 Cases.
China.....	1,408,962	2,456,857
Japan.....	2,452,214	1,286,731
India.....	2,610,336	3,325,815
Java, Singapore, etc.....	2,437,728	3,099,707
Total October 31st.....	8,906,300	10,169,110
Total September 30th.....	8,382,188	9,546,585
Clearances for October.....	524,112	622,525
Clearances for September.....	920,821	283,751
Clearances for August.....	1,006,761	549,916
Clearances for July.....	852,078	1,028,427
Clearances for June.....	1,084,921	1,471,362
Clearances for May.....	919,571	1,112,522
Clearances for April.....	1,085,363	742,478
Clearances for March.....	1,157,823	2,058,609
Clearances for February.....	733,626	1,281,488
Clearances for January.....	591,221	1,018,033
Total.....	8,906,300	10,169,111

REFINED QUOTATIONS FOR OCTOBER.

	New York	Philadelphia	Baltimore	London and Liverpool	Bremen	Antwerp
	Cts.	Cts.	Cts.	Pence.	Marks.	Francs
1.....	6½	6½	6½	5¼	6.20	15½
2.....	6½	6½	6½	5¼	6.20	15½
3.....	6½	6½	6½	5¼	6.20	15½
4.....	6½	6½	6½	5¼	6.20	15½
5.....	6½	6½	6½	5¼	6.20	15½
6.....	6½	6½	6½	5¼	6.25	16
7.....	6½	6½	6½	5¼	6.25	16
8.....	6½	6½	6½	5¼	6.25	16
9.....	6½	6½	6½	5¼	6.25	16
10.....	6½	6½	6½	5¼	6.35	16
11.....	6½	6½	6½	5¼	6.35	16
12.....	6½	6½	6½	5¼	6.35	16
13.....	6½	6½	6½	5¼	6.35	16
14.....	6½	6½	6½	5¼	6.35	16
15.....	6½	6½	6½	5¼	6.35	16
16.....	6½	6½	6½	5¼	6.35	16
17.....	6½	6½	6½	5¼	6.35	16
18.....	6½	6½	6½	5¼	6.35	16
19.....	6½	6½	6½	5¼	6.35	16
20.....	6½	6½	6½	5¼	6.10	16½
21.....	6½	6½	6½	5¼	6.40	16½
22.....	6½	6½	6½	5¼	6.40	16½
23.....	6½	6½	6½	5¼	6.40	16½
24.....	6½	6½	6½	5¼	6.40	16½
25.....	6½	6½	6½	5¼	6.40	16½
26.....	6½	6½	6½	5¼	6.40	16½
27.....	6½	6½	6½	5¼	6.40	16½
28.....	6½	6½	6½	5¼	6.40	16½
29.....	6½	6½	6½	5¼	6.40	16½
30.....	6½	6½	6½	5¼	6.40	16½
31.....	6½	6½	6½	5¼	6.40	16½

SUMMARY of the Statements of the National Transit Company for September and October.

	October. Barrels.	September. Barrels.
Receipts from all sources.....	1,852,563.59	1,730,614.38
Deliveries.....	2,151,022.18	1,886,690.83
Gross stocks end of month.....	31,531.99.85	32,179,251.92
Sediment and surplus.....	3,511,905.80	3,849,549.52
Total liabilities end of month.....	28,023,085.05	38,349,702.40
Outstanding acceptances.....	20,844,036.33	20,959,036.33
Credit balances.....	7,179,018.72	7,340,666.07

The above "receipts from all sources" for October were made up as follows:

Runs from wells.....	1,236,012.64
Received from other lines.....	556,520.95
Received in iron tanks.....	

Total..... 1,852,563.59

The above "total deliveries" for October were made up as follows:

Regular shipments.....	2,123,224.27
Delivered to other lines.....	27,797.91

Total..... 2,151,022.18

The above "receipts from all sources" for September were made up as follows:

Runs from wells.....	1,181,663.42
Received from other lines.....	525,759.54
Received in iron tanks.....	23,191.42

Total..... 1,730,614.38

The above "total deliveries" for September were made up as follows:

Regular shipments.....	1,843,686.10
Delivered to other lines.....	43,004.73

Total..... 1,886,690.83

OCTOBER OPERATIONS.

THE ENTIRE REGION—WELLS COMPLETED, WELLS DRILLING, AND RIGS UP AND BUILDING.

WELLS COMPLETED IN OCT., 1887.

Allegany Field.

Twp.	Owner.	Barrels.
Wirt, 61, (De. o)	Empire Gas Co, (for gas)	gas
" 61, Rollin Dow		gas
Clarksville, 27, (Nichol)	Love & Patterson	5
Wells completed		3
Production		8
Dry		1

Bradford Field.

East and West Branches.

Mack, Manufacturers Gas Co No 6 (for gas)	gas
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Knapps Creek.

Rixford, Duke Centre Gas Co (for gas)	gas
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Miscellaneous.

Little Valley, Little Valley Oil Co	dry
Wells completed	3
Production	0
Dry	3

Warren and Forest.

GLADE AND OTHER TOWNS.

Kinzua Village.

Hodge, Morse estate No 9	50
" " No 10	40
White, " No 13	40
5546, Collins & Phillips	dry
Wells completed	4
Production	130
Dry	1

Clarendon.

Stonehill, Nutting & Co	5
558, Goal Bros No 6	3
Wells completed	2
Production	8

Tiona.

200, Wesley Chambers No 8	5
200, " " No 9	5
Wells completed	2
Production	10

Kane.

343, (Looker) Ernhaunt & Co No 3	10
343 (Ryan) Manufacturers Gas Co No 2	gas
342 (Welker) " " No 3	gas
383 (Blood) Kane Gas Co	2
Wells completed	4
Production	13
Dry	2

Grand Valley.

Whaley, Thos Cummings	3
Campbell, National Oil Co No 18	5
" " No 21	6
Hunter, " No 11	6
" " No 12	6
" " No 13	5
Reeves, " No 3	5
Lot 150, Nelson Farrell, No 16	8
Lot 104, Lord & Co	dry
Lot 145, Fulton Oil Co	dry

Wells completed	10
Production	44
Dry	2

Miscellaneous—Elk Co., Etc.

1799, (Sub 2) Gillis Farm Oil Co No 1	3
2020, Andrews & Barnsdall No 2	15
2020, " " No 3	15
2033, Highland Oil Co, No 5	10
2576, Wilcox Oil Co No 4	gas
2586, Armstrong & Co	dry
3779 (Crawford) Sill & O ell No 2	gas
2533 (Millstone twp) Welsh & Wallace	gas
Pro er (Forest Co) J Wol ott & Co	dry
Ludlow (McKean Co) Penn'a Gas Co	gas
Freeman's Station, Kuox Bros	dry

Harmony Township, Forest County.

Bromley, Wood & Stewart	dry
Muaross, John J. Carter No C	10
Fogel, " No E	5
Copeland, " No 4	8
Beaver & Kep'ler, K rnoch Bros No 2	3
Wells completed	16
Production	65
Dry	8

Lower Country.

Venango and Other Sections.

Farm.	Operator.	Barrels.
McKinley, B aunschweiger No 3		5
McKinley, Haines & Co		5
Blood, P Bankson		dry
Curtis, Thomas Smith, No 4		5
Anderson, Trax & Simmons No 2		2
Pithole (Woo Farm) Innis & Co No 1		dry
Raymilton, (McClellan) Doyle		3
Pin Oak, (Mead) J B Smithman		5
Pin Oak, (Dale) A P Dale		5

Vicinity Pleasantville.

Tallman, W P Black No 9	8
Poor, T C Joyce & Co No 3	4
Gregg, Black, Lord & Farrell	4
Dawson, White & Kraeffert, No 2	5
Atkinson, Culp & Stewart No 3	5
Atkinson, Wait Bros No 3	6
Fisher, Young & Locke No 5	5
Week ev, R Foygins	3
Mill, Ed Gray	3
Vesta Pet'm Co, Bredin Bros	5

Slab Furnace.

McCalmont, E Cr wford & Co No 2	8
Phil & Bost, Porterfield, Kelley & Co No 3	4
Phil & Bost G odrich & Salisbury No 2	3
Steppey, Snd & Geizer No 1	5
J K Dale, Shafer & Dale No 1	10
Phil & Bost, Guckert & Co No 2	3
Wickersham, Guchert & Co No 3	5
Raisen, Warner & Co No 3	4
Keystone, Duffield & Co No 4	5
S P McCa mont, Koch Bros No 1	8
Plumer, Reeder & McKinney	2

Mt. Hope and Smoky District.

Carner, Carner & Co	3
Brandon, Sheasley & Galbraith No 3	dry
J Dale (Egypt) R ss & Dale	3
Cochran, D E Swan	2

Vicinity Emlenton.

Flynn, Flynn gros	4
Logue, Guard & Co	dry

Bullion.

Atwell, Hovis & Co	dry
Crawford, McFadden & Co	dry

Red Valley.

Pars on, Bra lstreet	5
Campbell, Whitely & Co	10
Wells completed	40
Production	162
Dry	6

Clarion.

Wagner, Hahn & Wagner	dry
Baker, John Irwin	1
Bazza, Wm Heeter	10
Sligo Furnace, Miller & Son	gas
Shippen, John J Carter No 13	8
Wells completed	5
Production	19
Dry	2

Butler and Armstrong.

Goehrin z, Thos W Phillips No 1	2
Geo Behm, " No 5	432
A H Behm, " No 6	360
Thorn Hill, Mnnhall No 1	50
Stahm, Th s W Phillips No 4	25
Ma kle, Thos W Phillips No 12	45
Miller, Schlegel	dry
C. Rodgers, G Fetzner	dry
Corle, M. P. Black & Co No 3	10
Robert Gibson Brown & Co	gas
Bromfield, Vensel & Co	12
Critchlow, Steinbrock, (est)	25
Winner, McGuire	dry
A A Black, Seibert Bros	15
Jennings, Jennings No 5	3
Williams, Thomas	3

Thorn Creek.

Harbi-on, Connors & Fishel	5
Bulford, C D. Greenlee	5

Saxonburg.

Widow Lonitz, Bolard, Greenlee & Co	900
H. Lonitz, Golden, Weller & McBride	150
Adler, Bolard, Greenlee & Co	75
Wells completed	21
Production	2117
Dry	4

Washington.

Nicholls, Willetts & Son	dry
McLain, J M Gufley, Iseman & Co No 1	dry
Arthur, Sprout's	dry
Sodom (Alle beny Co) Manufacturers'	gas
Natural Gas Co	gas
Wells completed	4
Production	0
Dry	4

DRILLING WELLS.

RIGS UP AND BUILDING OCTOBER 31, 1887.

Allegany Field.

Scio.

Lot.	Owner.	Depth.
3, Coyle & Simon (old)		rig
12, Allen & Morse (old)		rig
12, Griffin & Co No 10 (old)		rig
50, Pease & Coyle No 9 (old)		rig
46, L. G. Norton No 4 (old)		rig
New rigs		0
Old rigs		5
Drilling		0
Total		5

Alma.

4, Breckenridge & Co, shut down	1200
3, M J McMullan & Co No 5 (old)	rig
23, Vance & Hor on (old)	rig
26, Wl letts & Elliott (old)	rig
51, Sawyer & Co (old)	rig
120, McCalmont Oil Co No 10 (old)	rig
New rigs	0
Old rigs and shut down	6
Drilling	0
Total	6

<i>Wirt.</i>		<i>Knapp's Creek.</i>		<i>Clarendon.</i>	
14, Allegany Gas Co (for gas).....	drilling	Matthews, C B Whitehead No 6 (old).....	rig	51, Citizens' Gas Co.....	rig bldg
61, (Devo) Empire Gas Co (for gas).....	drilling	Borden, T P Thompson (old).....	2 rigs	105, Tucker & Co (old).....	rig
55, P M Shannon & Co (old).....	rig	Mulvancy, Eldred Board of Trade (for gas).....	drilling	532, C A & D Cornen N 5, shut down.....	900
52, (Jacob Jordau) Wilson & Johnston No 9 (old).....	rig	G E lis, Eldred Gas Co No 2 (for gas).....	drilling	556, J A Waterhouse & Co No 25 old.....	rig
61, (J Jordan) Ackerly, Barton & Co (old).....	rig	New rigs.....	0	556, " " No 26 old.....	rig
61, (Isaiah Jordan) Lester, Jordan & Co No 6 (old).....	rig	Old rigs.....	3	556, " " No 27 old.....	rig
61, " " No 7 (old).....	rig	Drilling.....	2	562, Goal Bros No 6.....	sand
62, (Peterson) Limekiln Club No 4 (old).....	rig	Total.....	5	New rigs.....	1
62, (Latham) " No 1 (old).....	rig			Old rigs.....	5
New rigs.....	0	<i>Foster Brook.</i>		Drilling.....	1
Old rigs.....	7	E T Co, Kervin & Co No 11.....	d illing	Total.....	7
Drilling.....	2	" " No 12.....	rig		
Total.....	9	" " (o d).....	rig	<i>Tiona.</i>	
		C B & H, Juter & Yager (old).....	rig	284, Watson & Mitchell No 8 (old).....	rig
		" Barus & Monroe (old).....	rig	200, Wesley Chambers No 10.....	sand
		New rigs.....	1	New rigs.....	0
		Old rigs.....	3	Old rigs.....	1
		Drilling.....	1	Drilling.....	1
		Total.....	5	Total.....	2
<i>Bolivar.</i>		<i>Four Mile.</i>			
12, Wood & Co (old).....	rig	Van Campen, Coldren & Vance (old).....	rig	<i>Cooper District.</i>	
23, F C Streeter & Co No 12 (old).....	rig	" Jas K Van Campen No 3 (old).....	rig	407, Shank & Stewart No 9 (old).....	rig
New rigs.....	0	Dye, Manhattan Oil Co No 5 (old).....	rig	407 " " No 13 (old).....	rig
Old rigs.....	2	New rigs.....	0	New rigs.....	0
Drilling.....	0	Old rigs.....	3	Old rigs.....	2
Total.....	2	Drilling.....	0	Drilling.....	0
		Total.....	3	Total.....	2
<i>Genesee.</i>		<i>Indian Creek.</i>			
14, Merwin (old).....	rig	Hamlin, M B Squiers No 4 (old).....	rig	<i>Balltown.</i>	
22, I Willetts No 14 (old).....	rig	W & M, Dusenbury & Wheeler (old).....	3 rigs	3194 Poreupine Oil Co No 39 (old).....	rig
22, " No 15 (old).....	rig	G C Barden, Cook & Dodd No 4 (old).....	rig	3195, (Crisman) N F Clark No 14 (old).....	rig
22, " No 16 (old).....	rig	New rigs.....	0	Cook, Grandin & Co (old).....	rig
22, " No 17 (old).....	rig	Old rigs.....	5	Schooley, J C Welsh.....	rig
22, " No 18 (o d).....	rig	Drilling.....	0	New rigs.....	1
23, Coughlin (old).....	rig	Total.....	5	Old rigs.....	3
29, William Cranston (old).....	rig			Drilling.....	0
8, I Willetts.....	drilling	<i>Cole Creek.</i>		Total.....	4
New rigs.....	0	Warrant 2263, Union Oil Co No 6 (old).....	rig		
Old rigs.....	8	" 2263, " No 7 (old).....	rig	<i>Kane.</i>	
Drilling.....	1	Bingham, lot 69, Bennett & Thompson No 11 (old).....	rig	344, Collins & Heasley (old).....	rig
Total.....	9	" lot 477, Tucker & Rolfe No 3 (old).....	rig	420 Aem- Oil Co (old).....	rig
		New rigs.....	0	3767, Union Oil Co (old).....	rig
		Old rigs.....	4	342 (Welker) Manuf'rs Gas Co No 4.....	rig
		Drilling.....	9	Town lot, Citizens' Gas Co.....	drilling
		Total.....	4	New rigs.....	1
				Old rigs.....	3
		<i>Kinzua.</i>		Drilling.....	1
		Guffy & Hulings, Union Oil Co No 73 (old).....	rig	Total.....	5
		Lot 128, Newell & Quigley No 5.....	drilling		
		Lot 128, " No 6 (old).....	rig	<i>Grand Valley.</i>	
		Warrant 2605, Newell & Co No 1.....	rig bldg	Campbell, National Oil Co No 22 (old).....	rig
		New rigs.....	1	Lot 136, G L Kepler & Co (old).....	rig
		Old rigs.....	2	" 137, " (old).....	rig
		Drilling.....	1	" 150, Nelson Farrell No 17.....	sand
		Total.....	4	" 238, J B Jennings & Grandin (old).....	rig
				" 103 Lord & Co.....	drill in
		<i>Miscellaneous.</i>		Spring Creek, Harnson Bros.....	drilling
		Hussey, Smethport Gas Co.....	drilling	New rigs.....	0
		New rigs.....	0	Old rigs.....	4
		Old rigs.....	0	Drilling.....	3
		Drilling.....	1	Total.....	7
		Total.....	1		
<i>Bradford Field.</i>		<i>Miscellaneous.</i>		<i>Miscellaneous—Elk County, Etc.</i>	
<i>East and West Branches.</i>				2026, Clinton Oil Co No 1.....	sa. d
Clark, Clark & Owens shut down.....	1000			2032, Bogs, Rosenberg & Co No 4 (old).....	rig
Mack, Columbia Oil Co (old).....	rig			2032, Bogg, Rosenberg & Co No 5 (old).....	rig
Mack, Fisher Oil Co No 19 (old).....	rig			2033, Clark & Foster No 8 (old).....	rig
Paton, McClure & Co (old).....	rig			5664, " No 5 (old).....	rig
Clark, McCray Bros (old).....	rig			363, Elk Oil Co (fishing).....	18.0
Clark, Clark & Owens.....	rig			2020, Andrews & Barnsdall No 4.....	1500
				2020, " No 5.....	500
<i>Quintuple.</i>				203, Highland Oil Co No 6.....	1300
25, O H Strong (old).....	rig			2033, " No 7.....	rig bldg
44, J W Humphrey (old).....	rig			2027, Mik S lk & Co (shut down).....	sand
230, E T Howes (old).....	rig			2676, (McKean) Wilcox Oil Co No 3.....	rig
New rigs.....	1			Millstone twp, Johnson O'Dell & Co (shut down).....	sand
Old rigs and shut down.....	7			Ludlow, Pennsylvania Gas Co.....	drilling
Drilling.....	1				
Total.....	9				
		<i>Warren and Forest.</i>			
		GLADE AND OTHER TOWNS.			
		<i>Kinzua Village.</i>			
		White, Mo se estate No 14.....	rig		
		5365, Phillips & Collins No 2 (old).....	rig		
		Sugar Grove, Sugar Grove Gas Co.....	sand		
		New rigs.....	1		
		Old rigs.....	1		
		Drilling.....	1		
		Total.....	3		

2684, (McKean) National Transit Co	No 32....	drilling
2695, " " "	No 34....	drilling
2685, " " "	No 35....	drilling
2695, " " "	No 37....	rig bldg
3212, Armstrong & Co		100
5508, (Forest) Shannon Syndicate		
(shut down)....		1675

Harmony Township, Forest County.

Munross, John J Carter No D....	sand
" " " No F....	drilling
" " " No G....	drilling
" " " No H....	rig
McNitt Bovee & Duck	drilling
Pineville, J Neal	drilling
New rigs.....	4
Old rigs and shut down.....	7
Drilling.....	15
Total.....	26

Lower Country.

Venango and Other Sections.

Ross, B F Brundred No 7 (old).....	rig
McKinley, M Braunschweiger No 4 drilling	
Osmer, Galbraith & Parker (old)....	rig
Rand, Wratten & Co (old).....	rig
Niagara, Henry Wilbert.....	100
Curtis, Geo Wratten (old).....	rig
Anerson, Trax & Simmons No 3....	rig
Pierson, (Benninghoff) Stewart & Culp....	sand
Dalzell, W J McCray.....	sand
Steele, J W Waits.....	30
Pithole, (Wood farm) Davis & Innis	No 2 rig
Cherry Tree, H Goehring & Co (old)	rig
Raymlton, (Simcox) Simcox & Co	No 2 sand
Pin Oak (Dale) A P Dale.....	rig
Kennerdell, W. T Baum.....	rig

Vicinity Pleasantville.

Landis, W P Black (old).....	rig
Tallman " No 10.....	rig
Bene dict, ".....	drilling
Muttonson ".....	abandoned
Alkorn, A B own.....	drilling
Dawson, White & Co No 3.....	drilling
Tallman, Joy & Co.....	sand
Fisher, Young & Locke No 6.....	rig bldg
Herbert, Dr Shamburg (old).....	rig
Weekley, R Foggins.....	rig bldg
Tarr, Wilhelm & Kearney No 2 (old)	112
P Becker, H Miles (old).....	rig
Farrell, Sheldmadine & Durham.....	drilling

Tipperary, Hall's Run, Etc.

Reese, Wesley Chambers.....	drilling
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Slab Furnace.

McCalmont, E Crawford No 3.....	rig
Phil & Bost. Porterfield, Kelley & Co No 4.....	drilling
" " " No 5.....	drilling
" " " No 6.....	rig bldg
" Goodrich & Salisbury No 3.....	rig
Sleppy, Judd & Geizer No 2.....	rig
J K Dale, Shafer & Dale No 2.....	drilling
Wickersham, Guert & Co No 3.....	rig
Raisen, Warner & Co No 4.....	drilling
Key tone lands, Dunfield & Co No 2.....	rig
Mays, Moriarity & Co No 2 (fishing)	sand
Mitchell, Mitchell & Steele (dry in 2nd sand).....	drilling
Keystone, Hart Bell.....	rig
S P McCalmont, Kock Bros No 2.....	rig bldg
Wilhelm, Heeter & Co.....	drilling
McCalmont, Mays Bros & Church.....	drilling
Geo M ys, Mays & Davis.....	rig
Plummer, Louts & Co.....	rig
McCalmont & Colbert, Ritts & Co.....	rig

Byrom Centre.

Marks, J P Crawford.....	rig
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Mt. Hope and Smoky District.

Milner, Galbraith & Smith No 5.....	rig bldg
McElphatrick, D McElphatrick.....	drilling
J K Dale (Egypt) Ross & Dale.....	drilling
H M Dale, (Egypt) H M Dale.....	rig

Six Points.

Everett, McGrew & Kerr.....	sand
Hayes, James Bennett.....	80
Roy L, Thomas & Chapin.....	700
Flynn, Henry & Co.....	sand
Thompson, Sherwood & Galbraith.....	sand

Vicinity Emlenton.

Porterfield, Porterfield & McCombs	560
McCombs, Halderman.....	200
" " ".....	rig
Steinberg, Porterfield & McCombs	rig
Williams, Dr. Hamilton.....	500
Rehney Run, Morgan & Fox.....	drilling
Mark, J P Crawford.....	rig

Bullion.

Crawford, McFadden & Co.....	rig
Eaken, Beeson & Co.....	drilling
New rigs.....	25
Old rigs and shut down.....	9
Drilling.....	32
Total.....	66

Clarion.

Ossil, Kribbs & Co.....	900
Wagner, H hn & Wagner.....	drilling
Rapp, H hn & Son.....	300
Baker, John Irwin.....	rig
Fillman, J R Fillman.....	rig
John Hen l, Koch Oil Co No 8 (old)	rig
Lloyd, Dr Metzger (old).....	rig
Shreffler, McCallom & Co (old).....	rig
Wagner & Carl, J V Ritts (old).....	rig
Brown, J V Ritts (old).....	rig
Hesley, Hesley & Co (old).....	rig
Creswell, Lee & Co.....	drilling
Kosuth, Heater.....	drilling
Pitch Pine, Berlin & Son.....	rig
New rigs.....	3
Old rigs.....	6
Wells drilling.....	5
Total.....	14

Butler and Armstrong.

Chas Duffey, Hoch & Co (old).....	rig
Blakeley, Coast & Co No 3.....	1400
Galebaugh, Le decker Bros No 1.....	1300
Schlegel.....	rig bldg
Snow, Gantz & Co.....	1200
Behm, Winkle Oil Co No 4.....	sand
Bish, Shawalter Bros.....	1350
Jno Boyle, Rev Quilter.....	700
Rev Jickey, B ashwood Development Co No 8.....	1200
Gumpper, Brady & Co.....	rig
A A Black, Seibert Bros No 2.....	rig bldg
Craigtown, J M Guffey & Co.....	drilling
Will, Burns & Co.....	drilling
McElwee, Shryock.....	300
Giespie, Campbell & Murphy.....	drilling
John Rogers, James Rabbitt.....	drilling
Duffey, McLaughlin & Co.....	rig
Knox, Jordan Bros.....	drilling
Crawford, Peter Smick.....	1100
Galebaugh, Connors & Fishel No 1.....	rig
Warren, Munhall & Co No 2.....	200
Marshall, Munhall & Co No 1.....	rig bldg
Marshall, Charles Oil Co.....	rig bldg
Duncan, McKelvey & Co.....	rig
Lloyd, Stage & Co.....	rig
Irwin, Coe & Beeson.....	drilling
Harbison, Connors & Fishel (old).....	rig
Bulford, A K Klingensmith.....	300
Dixon, Dr Reynolds.....	drilling

Saxonsburg.

Adler, Bolard, Greenlee & Co No 2.....	rig bldg
Wid Lonitz, ".....	No 2 drilling
Badenfelder, ".....	No 1 drilling
H Lonitz, ".....	No 2 drilling
" " ".....	No 3 rig
Pohle, ".....	No 1 rig
" " ".....	No 2 rig bldg
Lower, (H Lonitz) Greenlee & Co	No 1 drilling
Beauman, Greenlee & Co No 1.....	drilling
" " ".....	No 2 rig
" " ".....	No 3 rig
Crawford, J G Haymaker & Co.....	drilling
" " ".....	rig bldg
Badenfelder, Extension Oil Co.....	drilling
Adehold, Clark & Co.....	rig
Seibert, John A Snee & Co.....	drilling
Grabe, R R Armor.....	rig

Adler, Urquhart, Lavens & Co No 1.....	1600
" " " No 2.....	300
" " " No 3.....	50
Englehart, ".....	No 1 rig
Foercht, ".....	No 1 rig
George Welch, R R Armor.....	rig
H Lonitz, Golden, Weller & McBride	No 2 drilling
" " " No 3.....	rig
Pfabe, ".....	No 1 sand
Adlerhold, ".....	No 2 drilling
Adler, Thompson, Holland & Co	No 1 sand
" " " No 2.....	250
" " " No 3.....	rig
Beauman heirs, Iman & Co No 1.....	1200
" " " No 2.....	drilling
" " " No 3.....	rig
Severance, Marshall Oil Co No 1.....	rig
" " " No 2.....	rig bldg
Pfabe, Reiber & Co.....	rig

New rigs.....	26
Old rigs.....	2
Drilling.....	36
Total.....	64

Washington.

I Wilson, Forest Oil Co (old).....	rig
Mun e, John McKeown No 17.....	800
Marlin heirs, John McKeown.....	1900
Coal Center, Hornbake (shut down)	1500
Wiles, C O & Gas Co No 1.....	1900
McKeesport, Stone & Co.....	drilling
Bane, Ten-Mile Oil Co (shut down)	1039
Fergus, Chartiers Oil Co No 7 (old).....	rig
Bailey, McKennan Oil Co.....	1900
West Belle Vernon, (for gas).....	drilling
California, J M Guffey (old).....	rig
Munce, I Willetts & Son No 29 (old)	rig
Davis, Davis Bros No 2.....	rig
Paint lot, Harris & Co.....	sand
Taylor, P L & H Co No 2.....	1900
Cameron, Willetts & Young.....	900
Miller, Marshall Oil Co No 2.....	1650
Borland (Cecil twp) H O Robbins.....	drilling
S Fergus, S Fergus.....	rig

Cannonsburg.

A Griffin, Scott & Co.....	1050
W Pollock, Scott & Co.....	700
J Buchanan Fisher Oil Co.....	800

Taylorstown.

Hutchinson, W Va Nat Gas Co No 1	(fish ng).....
Vincent & Blancy, ".....	800
J McMannis, " No 2.....	1000
N eley, " No 1.....	1600
Work, Ten Mile Oil Co.....	500
Carson, Roth, Peiffer & Dyer, & Claysville Oil Co.....	sand
Martin, Kuntz, Todd & Co (old).....	1650
Sam Wright, W Va Nat Gas Co.....	rig
John Grimes, Marshall Oil Co.....	rig

New rigs.....	3
Old rigs.....	5
Drilling.....	19
Total.....	27

Shannopin.

T Pinkerton, J S McKelvy (old).....	rig
Chas Eacnel, Raccoon Oil Co No 4	(old).....
Jno Morrow, Raccoon Oil Co No 4	(old).....
Andrews, Philadelphia Co.....	rig
Montour Run, ".....	drilling
H E McBride, J A Tomlinson.....	drilling
	1700

Greene County, Etc.

Fordyce, E M Hukill & Co No 1	(shut down).....
Girard, E M Hukill & Co No 1 (shut down).....	1360
" " " No 2.....	1060
" " " No 2.....	2000
Mt. Morris, E M Hukill & Co.....	drilling
Long necker, E M Hukill & Co (old).....	rig
Ninevah, Johnson & Hamilton.....	drilling
Carmichaels, E M Hukill & Co.....	drilling
New rigs.....	0
Old rigs and shut down.....	4
Drilling.....	7
Total.....	11

FIELD OPERATIONS SUMMARIZED.

WELLS COMPLETED, WITH THE ESTIMATED PRODUCTION ON THE LAST DAY OF THE MONTH.

ALLEGANY FIELD.

Division of Field.	OCTOBER, 1887.			SEPTEMBER, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Scioto.....	0	0	0	0	0	0
Alma.....	0	0	0	0	0	0
Wirt.....	2	3	1	3	5	2
Bolivar.....	0	0	0	0	0	0
Clarksville.....	1	5	0	3	17	0
Genesee.....	0	0	0	0	0	0
Miscellaneous.....	0	0	0	0	0	0
Total.....	3	8	1	6	22	2

BRADFORD FIELD.

Division of Field.	OCTOBER, 1887.			SEPTEMBER, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
E. and W. Branches.....	1	0	1	0	0	0
Kendall Creek.....	0	0	0	4	40	0
Foster Brook.....	0	0	0	3	17	0
Knapp's Creek.....	1	0	1	1	3	0
Four Mile.....	0	0	0	1	6	0
Indian & Meeks Creeks.....	0	0	0	1	5	0
Cole Creek.....	0	0	0	1	10	0
Kinzua.....	0	0	0	1	6	0
Miscellaneous.....	1	0	1	1	0	1
Total.....	3	0	3	13	87	1

WARREN AND FOREST.

District.	OCTOBER, 1887.			SEPTEMBER, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Glade.....	4	130	1	4	160	1
Clarendon.....	2	8	0	4	16	1
Tiona.....	2	10	0	3	17	0
Cooper.....	0	0	0	0	0	0
Balatown.....	0	0	0	1	10	0
Kane.....	4	13	2	0	0	0
Grand Valley.....	10	44	2	9	30	2
Miscellaneous.....	16	65	8	12	46	6
Total.....	38	270	13	33	279	10

LOWER COUNTRY.

District.	OCTOBER, 1887.			SEPTEMBER, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Venango.....	40	162	6	40	280	41
Clarion.....	5	19	2	4	33	0
Butler and Armstrong.....	21	2117	4	21	458	9
Washington.....	4	0	0	10	935	1
Shonestown, Etc.....	0	0	0	0	0	0
Total.....	70	2238	12	78	1705	21

GRAND SUMMARY.

District.	OCTOBER, 1887.			SEPTEMBER, 1887.		
	Wells.	Prod'n.	Dry.	Wells.	Prod'n.	Dry.
Allegany.....	3	8	1	6	22	2
Bradford.....	3	0	3	13	87	1
Warren and Forest.....	38	270	13	33	279	10
Lower Field.....	70	2238	12	78	1705	21
Total October.....	114	2576	29	130	2094	34
Total September.....	130	2094	34			
Difference.....	16	482	5			

Rigs Up and Building—Wells Drilling.

ALLEGANY FIELD.

Division of Field.	OCTOBER 31, 1887.				SEPTEMBER 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Scioto.....	0	0	0	0	0	0	0	0
Alma.....	0	0	0	0	0	0	0	0
Wirt.....	0	0	0	0	0	0	0	0
Bolivar.....	0	0	0	0	0	0	0	0
Genesee.....	0	0	0	0	0	0	0	0
Clarksville.....	1	0	0	1	1	0	0	1
Miscellaneous.....	0	0	0	0	0	0	0	0
Total.....	1	0	0	1	1	0	0	1

BRADFORD FIELD.

Division of Field.	OCTOBER 31, 1887.				SEPTEMBER 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
E. and W. Branches.....	1	0	0	1	0	0	0	0
Kendall Creek.....	0	0	0	0	0	0	0	0
Knapp's Creek.....	0	0	0	0	0	0	0	0
Foster Brook.....	1	0	0	1	0	0	0	0
Four Mile.....	0	0	0	0	0	0	0	0
Indian Creek.....	0	0	0	0	0	0	0	0
Cole Creek.....	0	0	0	0	0	0	0	0
Kinzua.....	1	0	0	1	1	0	0	1
Miscellaneous.....	0	0	0	0	0	0	0	0
Total.....	3	0	0	3	1	0	0	1

WARREN AND FOREST.

Division of Field.	OCTOBER 31, 1887.				SEPTEMBER 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Glade.....	1	1	1	3	1	1	1	3
Clarendon.....	1	1	1	3	1	1	1	3
Tiona.....	0	1	1	2	0	1	1	2
Cooper.....	0	0	0	0	0	0	0	0
Balatown.....	1	0	0	1	1	0	0	1
Kane.....	1	0	0	1	0	0	0	0
Grand Valley.....	0	0	0	0	0	0	0	0
Miscellaneous.....	4	7	15	26	6	6	15	27
Total.....	8	26	22	56	12	29	28	69

LOWER COUNTRY.

Division of Field.	OCTOBER 31, 1887.				SEPTEMBER 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Venango.....	25	9	32	66	24	3	30	57
Clarion.....	3	6	5	14	1	6	6	13
Butler & Armstrong.....	26	2	36	64	11	2	28	41
Washington.....	3	2	19	24	7	3	18	28
Shonestown, Etc.....	0	4	7	11	0	4	4	8
Total.....	57	26	109	192	44	18	86	148

GRAND SUMMARY.

Field.	OCTOBER 31, 1887.				SEPTEMBER 30, 1887.			
	New Rigs.	Old Rigs.	Drilling.	Total.	New Rigs.	Old Rigs.	Drilling.	Total.
Allegany.....	1	34	6	41	2	33	3	38
Bradford.....	3	27	6	36	1	26	4	31
Warren and Forest.....	38	26	22	86	12	29	28	69
Lower Country.....	57	26	99	182	41	18	86	145
Total.....	69	113	133	315	56	106	121	283
Total Sept. 30.....	56	106	121	283				
Difference.....	13	7	12	32				

SUMMARY of the Statement of the Tidewater Pipe Company, Limited, for October, 1887:

Quantity of crude petroleum in custody at beginning of October.....	Barrels.	1,535,337.29
Quantity of crude petroleum at close of Oct.....	1,693,373.86	
Less sediment and surplus.....	161,953.59	
Receipts during October.....	1,531,420.27	
Received in iron tanks.....	193,781.77	
Deliveries during October—to refiners.....	223,502.82	
“ “ “ “ to other parties.....		
Outstanding certificates, accepted orders, etc.....	702,000.00	
Credit balances.....	829,120.27	
Total liabilities October 31, 1887.....	1,531,420.27	

SEPTEMBER SUMMARY.

Quantity of crude petroleum in custody at beginning of September.....	Barrels.	1,515,769.89
Quantity of crude petroleum at close of Sept.....	1,705,206.94	
Less sediment and surplus.....	170,869.65	
Receipts during September.....	1,535,337.29	
Received in iron tanks.....	165,195.06	
Deliveries during September—to refiners.....	216,961.79	
“ “ “ “ to other parties.....		
Outstanding certificates, accepted orders, etc.....	725,000.00	
Credit balances.....	810,337.29	
Total liabilities, September 30, 1887.....	1,535,337.29	

The Oil City Tube Company.

The advertisement of the Oil City Tube Company, which looms up prominently on our front page, will stir up the pride of every one interested in the oil country, as being a new and distinctive oil region enterprise. Manned by the capital and ability of leading oil men and manufacturers; and located admirably in Oil City, it will naturally enlist the good wishes and patronage of oil producers and natural gas men throughout the whole country.

THE Hudson Natural Gas and Land Company of Des Moines, Iowa, has been incorporated with a capital stock of \$130,000. Messrs. J. H. York, G. W. Haines, E. J. Adams, Tyler Scoville, Alexander Hastie and others, are corporators.

Stocks Abroad.

Reports of stocks in London, and the seven principal Continental ports, are summarized in the following statement:

STOCKS AFLOAT AND ASHORE	Oct. 22, 1887. Barrels.	Sept. 24, 1887. Barrels.
Seven Continental Ports	1,144,429	1,223,247
London	241,273	250,412
Total Stocks afloat and ashore	1,385,702	1,473,659
Decrease in stocks since Sept. 21	779	

A detailed statistical table giving the stocks on hand, the stocks in vessels on the ocean, and the amount unloading from the vessels at the different ports, is appended, which shows at a glance the condition of affairs abroad and the increase or decrease as compared with the corresponding period of 1886. The shipments represent the amount of oil going to the interior of Europe from the seaports:

STOCKS IN FOREIGN PORTS OCTOBER 22, 1887.

PORTS.	Stocks week ending Oct. 22.		Stocks afloat week ending Oct. 22.		Loading. Week ending Oct. 22.		Grand total stocks afloat and load ng.		Receipts From July 1.		Shipments from July 1.	
	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.	1886. Barrels.	1887. Barrels.
London	112,948	139,063	44,837	51,407	36,000	50,800	193,785	241,273	128,887	261,066	186,607	223,091
Bremen	159,684	125,407	24,852	24,441	35,200	42,500	219,736	192,348	166,997	241,935	218,689	266,914
Hamburg	133,128	116,68	46,542	137,721	58,300	47,000	237,970	301,402	570,954	441,890	392,491	425,370
Antwerp	140,622	81,915	108,736	90,222	47,500	98,300	296,858	270,437	262,742	227,911	282,820	250,678
Rotterdam	106,950	66,534	34,498	42,247	46,000	20,200	187,448	128,981	220,652	237,333	195,641	220,864
Amsterdam	56,345	17,311	8,350	35,874	8,000	---	72,695	53,185	91,895	54,825	103,028	68,752
Stettin	55, 75	115,914	72,269	31,732	3,800	8,100	131,644	155,746	175,115	226,498	136,333	148,196
Danzig	25,774	14,778	17,381	22,552	6,000	5,000	49,154	42,330	30,201	16,004	28,292	27,392
Total	678,078	538,540	312,627	384,78	204,800	221,100	1,195,556	1,444,429	1,318,556	1,446,396	1,357,294	1,408,066
Total stocks Continental Ports									1884.	1885.	1886.	1887.
Total afloat,									1,186,537	778,065	678,078	538,540
Total loading									330,320	213,277	312,627	384,789
Total									252,800	156,300	204,600	221,100
All at and loading for direct Continental Ports									1,770,157	1,147,642	1,195,505	1,144,429
“ “ “ Baltic Sea, exclusive Stettin and Danzig									11,700	---	---	---
“ “ “ Total Continental Ports									26,500	1, 00	10,300	---
“ “ “ Total London									1,808,357	1,149,142	1,205,805	1,144,429
“ “ “ English harbors, exclusive London									232,611	242,300	193,785	241,273
Grand total									180,700	86,300	167,700	42,200
									2,221,668	1,477,749	1,567,290	1,427,902

OFFICIAL STATEMENT—EXPORTS OF PETROLEUM, SEPTEMBER, 1887.

BY WM. F. SWITZLER, CHIEF OF BUREAU OF STATISTICS, WASHINGTON, D. C., OCT. 9, 1887.

CUSTOMS DISTRICTS	MINER'L CRUDE		NAPHTHAS		ILLUMINATING.		LUBRICATING & PARAFFINE OILS.		RESIDUUM.		TOTAL.	
	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.	Gallons.	Dollars.
Boston and Charles-town, Mass.					434,033	39,260	16,686	3,777			450,719	43,037
New York, N. Y.	3,383,389	208,963	891,891	81,659	30,379,733	2,220,691	1,395,138	261,175	1,302	124	36,051,753	2,772,622
Philadelphia, Pa.	4,775,341	234,455	567,726	43,998	11,800,397	826,800	31,617	3,057			17,175,079	1,158,310
Baltimore, Md.					546,506	37,130	15,809	2,100			562,309	39,230
Total for Sept., 1887	8, 58,730	493,418	1,459,617	125,657	43,160,661	3,123,881	1,459,250	270,109	1,302	124	54,230,560	4,013,189
Total for Sept., 1886	1,131,399	635,599	2,399,257	208,938	41,927,609	3,225,447	1,444,515	277,830	363,376	17,159	56,171,231	4,363,223
Total for 9 months ending Sept. 30, 1887	50,815,797	3,193,050	8,555,876	723,375	357,792,002	26,839,135	14,295,370	2,465,199	2,753,394	128,808	428,222,439	33,349,547
Total for 9 months ending Sept. 30, 1886	54,584,106	3,672,826	8,956,513	785,320	357,952,732	29,060,501	10,013,141	1,931,803	1,730,476	95,463	433,236,968	35,546,213

CRUDE QUOTATIONS FOR OCTOBER, 1887.

Day of Month and week.	BRADFORD.				OIL CITY.				NEW YORK.				PITTSBURGH.			
	Opened ..	Highest ..	Lowest ..	Closed ..	Opened ..	Highest ..	Lowest ..	Closed ..	Opened ..	Highest ..	Lowest ..	Closed ..	Opened ..	Highest ..	Lowest ..	Closed ..
S 1	68½	69¼	68¼	69	68¼	69½	68¼	69	68½	69	68¼	68¾	68¾	69	68¾	68¾
M 3	69	69	67¾	67½	69	69	67¾	67½	67¾	69	67¼	67¾	68¾	68¾	67¼	67¾
T 4	67½	67¾	67¼	67	67½	67¾	66¾	67	67¾	69	67	67¾	67¾	67¾	66¾	67¾
W 5	67¼	69¼	67¾	68½	67¾	69¼	67¾	68½	67¾	69¾	67½	68	67¾	69¾	67¾	68½
T 6	68	68¾	67¾	68½	68	68¾	67¾	68	68	68¾	67¾	68	68	68½	67¾	68
F 7	68½	68¾	68¼	68¾	68½	69	68¼	68½	68¾	69	68¼	68½	68¾	69	68¼	68¾
S 8	68½	68¼	68¾	68¾	68½	68¾	68¾	68¼	68½	78¾	68¼	68¾	68¾	68¾	68¾	68¾
M 10	68¾	69¾	68¾	69	68¾	69¾	68¾	69	68¾	70	68½	69	68¾	70	68¾	69
T 11	69¼	70¾	69¼	70¾	69¼	71¾	69¼	71	69	71	69	70¾	69¾	71	69¾	70¾
W 12	71	72½	69¾	70	71¼	72½	69¾	69¾	71	72½	69¾	69¾	71¼	72½	69¾	70
T 13	70	72	69¾	71¾	69¾	72	69¾	71¾	70	72	69¾	71¼	69¾	72½	69¾	71¾
F 14	71¾	71¾	70¾	71	71¾	71¾	70¾	71	71½	71¾	70¾	71	71¾	72	70¾	71¾
S 15	70	70¾	69¾	70¼	70	70¾	69¾	70¾	70¾	70¾	69¾	70	70¾	70¾	69¾	70¾
M 17	70¾	71¾	70¾	71¾	70¾	71¾	70¾	71¾	70¾	71¾	70¾	71¾	70¾	72	70¾	71¾
T 18	72¾	74¾	72¾	72¾	72	74¾	72¾	72¾	72	74¾	72	72¾	72¾	74½	72	72¾
W 19	74	75½	73¼	73¾	75	73¾	73¼	73¾	74	75¾	73	73¾	74	75¾	73¾	73¾
T 20	74	74	71¾	73	73¾	75¾	72¾	73¾	73¾	73¾	72¾	72¾	73¾	75¾	72¾	73¾
F 21	73	74½	73	74¾	73¾	74¾	73¾	74¾	73	74¾	72¾	74¾	73	74¾	73	74¾
S 22	74½	74¾	73¾	73¾	74¾	74¾	73¾	73¾	74¾	75	73¾	73¾	74¾	74¾	73¾	73¾
M 24	74	74¾	70¾	71¾	74	74¾	70¾	71¾	73¾	74¾	71	71¾	73¾	74¾	70¾	71¾
T 25	71¾	72¼	69¾	70	71¾	72¼	69¾	70¾	72¾	72¾	69¾	70¾	72	72¾	69¾	70
W 26	70¾	70¾	67¾	70¾	70¾	70¾	67¾	70¾	70¾	71	68	70¾	70¾	70¾	68	70¾
T 27	70¾	71	69¾	70¾	70¾	71	69¾	70¾	70¾	71	69¾	70	70¾	70¾	69¾	6¾
F 28	70¾	71¾	69¾	71¾	70¾	71¾	69¾	70¾	70¾	71¾	69¾	70¾	70¾	71¾	69¾	70¾
S 29	70¾	71¾	70¾	71¾	70¾	71¾	70¾	71¾	70¾	71¾	70¾	71	70¾	71¾	70¾	71¾
M 31	71¾	72¾	71¾	72¾	71¾	72¾	71¾	72¾	71¾	73	71¾	73	71¾	73	71¾	72¾

THE OIL FIELDS OF NORTHWESTERN OHIO.

During the month of October there were 12 wells completed in the Lima, Findlay and North Baltimore districts. The following is the report by the Buckeye Pipe Line :

WELLS COMPLETED.	
Lima District.....	5
Findlay District.....	0
North Baltimore District.....	7
Total.....	12
WELLS DRILLING OCT. 31.	
Lima District.....	4
Findlay District.....	0
North Baltimore District.....	16
Total.....	20
RIGS UP OCT. 31	
Lima District.....	22
Findlay District.....	11
North Baltimore District.....	10
Total.....	43

In addition to these figures the following is a summary of the work done in the new Haskins-Waterville district :

Wells completed.....	2
Wells drilling.....	5
Rigs building.....	1

Up to the first of April, 1887, about 430 wells had been drilled in the oil fields of northwestern Ohio. At that date there was a total of 372 wells producing oil from the Trenton rock, distributed as follows: Lima, 23; Findlay, 81; North Baltimore, 8. The following table is made up from the field reports, published by the Pipe Lines:

Productive wells to April 1.....	372
Productive wells completed in April.....	54
" " May.....	44
" " June.....	27
" " July.....	22
" " August.....	16
" " September.....	8
" " October.....	12

Total number of wells Nov. 1..... 549

The runs, shipments and stocks of the Buckeye Pipe Line are fully set forth in the following:

STATEMENT OF THE BUCKEYE PIPE LINES.

	Gross Stock.	Sediment & Surplus.	Total Liabilities.	Receipts.	Deliveries.
1886.					
June.....				23,851 13	
July.....				36,461 85	
Aug.....				50,001 41	
Sept.....				70,455 73	
Oct.....	287,428 89	8,433 89	278,995 00	127,467 74	3,518 42
Nov.....	40,472 72	7,672 32	395,800 40	121,153 31	4,347 91
Dec.....	534,994 94	8,329 39	526,66 55	137,982 22	7,117 07
1887.					
Jan.....	663,232 51	11,485 03	651,747 48	131,011 30	5,929 37
Feb.....	864,978 53	17,161 89	847,816 64	20,026 36	10,957 21
March.....	1,141,769 53	23,481 12	1,118,288 41	303,084 30	32,612 53
April.....	1,429,661 54	36,478 52	1,393,186 02	352,797 59	77,899 98
May.....	1,795,840 97	54,898 82	1,740,942 15	449,062 47	101,306 34
June.....	2,183,079 94	72,042 81	2,111,037 13	474,535 17	104,440 19
July.....	2,413,226 34	87,015 64	2,326,210 70	389,997 34	174,823 77
Aug.....	2,714,412 75	81,585 05	2,632,827 70	490,862 13	20,019 01
Sept.....	3,036,556 77	78,956 41	2,957,900 36	465,743 37	30,944 14
Oct.....	3,420,406 08	60,732 45	3,359,673 63	444,941 36	43,168 09

Runs, Shipments and Stocks.

RUNS OR RECEIPTS.

PIPE LINE.	SEPT., 1887.	OCT., 1887.
National Transit Co.....	1,181,663.42	1,296,042.64
Tidewater.....	165,195.06	193,381.77
Octave Oil Co.....	2,108.09	2,889.95
Keystone Pipe Line.....	24,434.40	120,009.90
Pittsburgh Pipe Line.....	168,343.8	175,054.00
Southwest Pennsylvania.....	305,988.65	249,998.63
Total.....	1,842,832.74	1,936,865.90
Daily average.....	61,427.76	62,479.54

In the above runs only the oil received by the National Transit

Co. directly from the wells, is included.

DELIVERIES OR SHIPMENTS.

PIPE LINE.	SEPT., 1887.	OCT., 1887.
National Transit Co.....	1,813,686.10	2,151,022.18
Tidewater.....	216,961.79	223,502.82
Octave Oil Co.....	3,290.75	2,878.35
Keystone Pipe Line.....	33,094.58	20,000.60
Pittsburgh Pipe Line.....	171,878.7	179,975.00
Southwest Pennsylvania.....	414,766.46	43,468.14

Total.....	2,633,668.35	2,620,806.49
Less oil transferred between lines.....	525,759.54	84,542.14

Total..... 2,157,908.81

Daily average shipments..... 71,930.29

In the above shipments only the oil delivered to refineries is included.

Daily excess of shipments over runs, October.....	20,442.82
Daily excess of shipments over runs, September.....	10,502.53
Daily excess of shipments over runs, August.....	8,973.79
Daily excess of shipments over runs, July.....	1,373.97
Daily excess of shipments over runs, June.....	4,915.93
Daily excess of shipments over runs, May.....	5,072.36
Daily excess of runs over shipments, April.....	4,083.43
Daily excess of shipments over runs, March.....	7,983.78
Daily excess of shipments over runs, February.....	3,564.10
Daily excess of shipments over runs, January, 1887.....	8,702.88
Daily excess of shipments over runs, December.....	11,270.81
Daily excess of shipments over runs, November.....	10,818.54
Daily excess of shipments over runs, October.....	580.75
Daily excess of runs over shipments, September.....	8,057.13
Daily excess of runs over shipments, August.....	11,931.56
Daily excess of runs over shipments, July.....	5,557.20
Daily excess of runs over shipments, June.....	4,793.41

NET STOCKS.

PIPE LINE.	SEPT. 30, 1887.	OCT. 31, 1887.
National Transit Co.....	28,329,702.40	28,023,085.05
Tidewater.....	1,535,837.29	1,531,420.27
Octave Oil Co.....	4,368.47	3,681.69
Keystone Pipe Line.....	16,528.74	16,538.74
Pittsburgh Pipe Line.....	133,200.63	131,484.00
Southwest Pennsylvania.....	945,631.63	775,576.02

Total.....	30,964,779.16	30,481,785.77
Stocks decreased October.....	42,993.39	
Stocks decreased September.....	293,299.48	
Stocks decreased August.....	284,874.16	
Stocks decreased July.....	47,794.24	
Stocks decreased June.....	174,012.20	
Stocks decreased May.....	286,403.15	
Stocks increased April.....	112,893.77	
Stocks decreased March.....	257,699.31	
Stocks decreased February.....	105,988.75	
Stocks decreased January, 1887.....	777,975.85	
Stocks decreased December.....	357,196.56	
Stocks decreased November.....	286,526.86	
Stocks decreased October.....	1,790.72	
Stocks increased September.....	214,073.99	
Stocks increased August.....	262,652.56	
Stocks increased July.....	188,510.62	
Stocks increased June.....	216,583.97	
Stocks increased May.....	110,800.44	
Stocks decreased April 1886.....	165,635.61	

RECEIPTS.

DELIVERIES.

Daily average October.....	62,479	84,542
Daily average September.....	61,428	71,930
Daily average August.....	59,466	68,439
Daily average July.....	59,769	61,143
Daily average June.....	63,413	68,329
Daily average May.....	64,522	69,794
Daily average April.....	65,072	60,988
Daily average March.....	63,915	71,899
Daily average February.....	63,374	66,938
Daily average January, 1887.....	62,629	71,332
Daily average December.....	67,857	79,127
Daily average November.....	70,767	81,586
Daily average October.....	76,019	76,600
Daily average September.....	77,989	69,932
Daily average August.....	76,880	64,949
Daily average July.....	74,880	60,323
Daily average June.....	75,811	71,017
Daily average May.....	68,602	64,635
Daily average April 1886.....	64,228	69,127

NOTE—The above figures are in barrels of 42 gallons each, and include only the pipe lines of the New York and Pennsylvania oil regions. In addition to the above receipts from 1200 to 1670 barrels of oil a day are shipped by rail out of the region by large producing firms which have no chartered pipe line.

American Oil Gaining on Russian.

To aid in viewing the foreign situation, we give the following table of exports of Refined oil from January 1st to November 1st, 1887, from New York, to countries where Russian competition has been met :

	1887.	1886.
	Galls.	Galls.
Africa.....	1,783,920	1,177,500
Algiers.....	1,203,790	469,260
Belgium.....	30,113,170	27,595,518
Egypt.....	3,743,950	2,626,857
England.....	39,610,348	34,902,624
Germany.....	65,629,720	53,183,682
Greece.....	150,000	
Italy.....	1,315,760	1,356,984
Turkey.....	2,134,894	2,192,740

Total.....	145,715,552	123,505,165
Increase in ten months, 1887.....		22,210,387

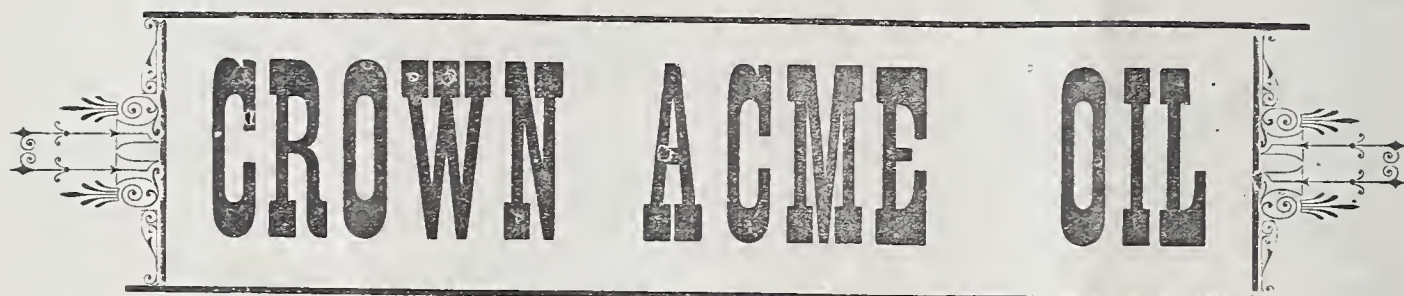
145,715,552	145,715,552
Increase in exports of Refined oil in ten months 1887, to countries named above.....	22,210,387 Gallons
Equivalent in Crude.....	705,091 Barrels

THE PETROLEUM AGE.

ACME OIL COMPANY,

→ **REFINERS OF PETROLEUM** ←

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THE PETROLEUM AGE.

VOL. VI.

BRADFORD, PA., JANUARY, 1888.

No. 12.

THE DEAD, UNBURIED CITIES.

BY C. F. ALLEN.

[To Aiken, Coleville and other cities of golden visions and hemlock boards; favored more in cheerful drinks than paint; transient, but wonderful; famous for many days, and buried through all the years to come; one who knew your glory, shared your shelter, and (sometimes) drank your beer, lays on your cheerless graves the token of kind and reverent memory.]

The snow upon the derrick floor
Lies white and cold and still;
The ghosts of drillers gone before
Crouch down upon the hill,
And Magic lifts her wand no more
Along the frozen rill.

As on Sahara's darkening sands
The tawny tents arise,
Yet all the waste deserted stands
Beneath the morning skies—
We saw the work of nimble hands
Fade out before our eyes.

The hemlock flung its fragrant shade
Above the pumper's door;
The muddy caravans of trade
Toiled painfully before;
And while the chopper swung his axe
The trader raised his store.

A railway shot its line of light
Among the slaughtered trees;
The derricks burned their lamps by night
Like boats on crowded seas;
And golden fountains shot in sight
On such lone lands as these.

A city built in sixty days
Along a single street,
Devoid of plaster—while it pays
Holds all the rest effete;
There is a glamor with the craze
Makes such delusion sweet.

And who recalls with wistful eyes
Its fortune's ebb and flow,
Will see the vanished city rise
As in the years ago,
And through its unforgotten skies
Hear elfin trumpets blow.

The derricks grow like fairy frames,
The golden fountains gleam;
A thousand half-forgotten names
Ring out as in a dream;
And every far-drawn vista flames
Through snowy clouds of steam.

Oh, city! fade and melt away,
As all thy visions fled!
Though all the magic hugles play
Thou art forever dead;
The rabbits haunt thy brambled way,
The owl sits overhead.

The derricks lift against the sky
Deserted, black and lone;
And sad Oblivion, hovering nigh,
Looks down upon her own;
And low thy hemlock castles lie
As Pharaoh's halls of stone.

THE PILLAR OF FIRE.

A LEGEND OF THE FRENCH AND INDIANS,
WITH AN INTERESTING SEQUEL.

[Written for the Louisville Courier-Journal by
A. R. Crum.]

THE autumn of the year 1755 was a glorious season in all that region between the great lakes and the Ohio river—mild, hazy and pleasant almost beyond belief of the dwellers in that section now. For the region was then a densely wooded one, inhabited almost exclusively by Indians, and not exposed as it now is to the biting blast of the Manitoba blizzard sweeping down from the Northwest and the alternate equatorial wave welling up from Galveston bay. The vast wilderness was peopled by countless deer, bears, wildcats and other quadrupeds of free, roving habits, and the streams were alive with finny denizens.

It was at this time that the French commander of Fort Duquesne left his citadel at the headwaters of the Ohio river, and with a select party from his garrison set out on an expedition of exploration and discovery. His course was northward, following the Kiskiminetas to its headwaters, thence across by the sources of Red Bank, Stump creek and the foothills of the Allegheny mountains to the sources of the Allegheny river, and then back home, following the tortuous course of that picturesque waterway. In fact, the greater part of the return journey was accomplished by floating down the stream in canoes or dugouts, made by hollowing out sections of great beech trees that abounded about the southern line of New York, though that State line was not surveyed until some years after the French commander's visit.

One day, as the party was floating down on the return trip, they noted a pretty bit of sloping ground on the right bank of the river, and, as the afternoon was pretty well advanced, they concluded to camp there for the night. This conclusion was all the more readily reached because the locality gave good promise of a plentiful supply of game for supper and breakfast, and because the party had already traveled about four leagues that day, their camp the night before having been at the mouth of the Connewango. Accordingly a landing was made, the canoes were tied up, a camp was made, and the party set out in search of game, leaving one of their number in charge of the camp.

Pierre soon fell into a dreamy reverie, with his eyes turned listlessly on the river and his thoughts wandering listlessly to his own bonny France and its vine-clad hills far away over the ocean. Smiles flitted over his features as he thought of what his pleasant home must look like in the golden autumn days, and

perchance the eye of his memory was gladdened by a vision of something fairer than the clustering grapes upon the vines. Mayhap a face dear to him appeared in the vineyard.

As the sun glowed over the tops of the towering pines on the westward hill it cast up into Pierre's eyes a thousand sparkling reflections from the rippled surface of the river. They twinkled, disappeared and reappeared again as they seemed to float down the stream. Pierre fell to thinking of fairies and water sprites mechanically, and to him these sparkles, dancing down the ripple, appeared to be an army of sprites passing that way with lanterns—good sprites who would throw light into dark places and drive evil out—for a bit of a philosopher was this Pierre. And then he vaguely fell to wondering why they all carried their lanterns on the side away from him so that the movement of their legs made them twinkle so. He felt half amused at two or three who seemed to take inordinately long strides, as indicated by the rays from their lanterns, while others minced along, appearing to tread on every little pebble in their course, and so Pierre fell to sleep and to dreaming. As his head inclined a little more backward toward the tree against which he was leaning, the hazy recollection of the sparkling lights upon the waters faded, and to his slumbering vision appeared a great mass of flame spread forth on the opposite bank of the river. It leaped from the earth at a point where the waking eye of Pierre had discerned the decaying stump of a fallen tree, and the flames went higher than the tops of the great pines. And Pierre noticed that there were no pines at that spot, as he had seen it before, but in their stead was a mysterious superstructure almost burned away. The column of flame grew brighter and more intense as Pierre's head dropped gradually back so as to bring his closed eyes up toward the western sun.

When the flame had reached its height and fury, Pierre began to reflect on what had caused it, and, as though in answer to his dream thought, the flame suddenly disappeared. Then he seemed to see more distinctly the superstructure on the spot where the old stump had been, and a number of human forms were gathered about it. One of these produced a little stick, rubbed it, and lo, it burned. Pierre had just begun to think how much better this was than flint and steel, when he saw it applied to a fagot. This latter on fire, the man leaned over and dropped it. It disappeared into the earth, but was followed instantly by a terrific explosion, the fire leaped again to the tree tops, and a human body was hurled up with it, to fall again and disappear into the earth at the base of the pillar of fire.

In his excitement Pierre leaped to his feet, rubbed his eyes and became aware that one of his comrades stood over him, smiling sardonically and holding a smoking musket in his hand. A glance toward the tree against which Pierre's head had been reclining showed where the charge from the gun had taken effect. Pierre laughed at the joke, but could not help looking across the river at the decomposed stump, and then at the sparkling reflections of light on the rippling water. He was soon as gay as usual, but he could not get his singular dream out of his mind. Reason as he would that the fire he saw in his dream was created by the action of the sun's rays upon his eyelids; that the sudden disappearance of the flame was due to his companion getting between him and the sun, and that the explosion was that of his comrade's flint-lock, playfully discharged above his head to frighten him awake. He still dwelt on the images of his sleeping phantasy, and when the others had come in, the game was cooked and eaten, Pierre had folded his blanket about him and fallen asleep, he dreamed that dream again. Figures moved about on the river bank around the structure erected there, the mysterious stick was lighted again and the flaming torch dropped into the earth, the explosion followed, the figures were dashed to the earth in all directions, and the one was hurled upward to the tree tops to fall again through the pillar of fire and disappear into the bosom of the earth at its base.

The next day the French commander and his party moved down the river; Pierre watched the lantern sprites playing about his canoe, and thought of his strange dream. When about fifteen leagues below the mouth of the Connewango they were about to reconnoitre at the mouth of a small stream, when they fell in with the chief of the Seneca Indians, and he invited them to journey up that stream with him to witness a religious ceremony of his tribe. The invitation was accepted, and all went eagerly but Pierre. He was disturbed about his dream and felt a strange uneasiness; but, of course, he went with the rest to witness the ceremony. In a letter to General Montcalm the commander says of this excursion:

"I would desire to assure you that this is a most delightful land. Some of the most astonishing natural wonders have been discovered by our people. While descending the Allegheny, fifteen leagues below the mouth of the Connewango and three above the Venango, we were invited by the chief of the Senecas to attend a religious ceremony of his tribe. We landed and drew up our canoes on a point where a small stream enters the river. The tribe appeared unusually solemn. We marched up the stream about half a league, where the company, a large band, it appeared, had arrived some days before us. Gigantic hills begirt us on every side. The scene was really sublime. The great chief then recited the conquests and heroism of their ancestors. The surface of the stream was covered with a thick scum, which, upon applying a torch at a given signal, burst into a complete conflagration. At the sight of the flames the Indians gave forth the triumphant shout that made the hills and valleys re-echo again. Here, then, is revived the ancient fire worship of the East; here, then, are the children of the Sun."

The burst of flame following the application of the lighted torch to the water started Pierre, and he almost cried aloud, expecting to see the human body of his dream hurled into the air. But his fear was not realized, and a moment later he observed that this wonderful fire was accompanied by dense smoke which curled up, a huge black column, to the sky. It was not the flame of his dream, for that had been smokeless. But it was so strange that it filled Pierre's heart with terror. This unnatural burning of the water in a creek, as he supposed it to be, was so like the mysterious stick that burned at a touch that Pierre knew not what might happen next. As he floated on down the Allegheny in his canoe with the rest of the party the dream preyed upon his mind and he grew morose and thoughtful. He feared that he had seen a token—a sign—that warned him to beware a fiery death, and so on arriving at Fort Duquesne he begged the commander to permit him to go home, and after a time his request was granted. A great weight was lifted from his mind when he finally embarked for his home in sunny France and watched the new world fade from sight as the ship sailed away. In his old peasant home again, he told Marie, sitting beneath the grapevines that were heavy with the luscious fruit of another autumn, of his loving reverie and terrible dream on the banks of the Allegheny.

* * * * *

One hundred and fifteen years after the date of Pierre's memorable dream, after the French had relinquished all claim to the territory adjacent to the Allegheny river and a great republic had been erected and almost been destroyed, namely, in 1865, when the petroleum which the untutored savage used in the worship of his deity had itself become the object of the worship of the tutored savage; when the red man's oil spring became the nucleus of the white man's wildcat stock companies; when the burning of oil on the waters as a sacrifice to the deity of the Senecas had been replaced by the burning of men in oil, a sacrifice to Mammon, the New York Enterprise and Mining Company undertook the task of sinking a shaft, eight by twelve feet, to the third oil sand at Tidioute, intending to tunnel the rock for petroleum in large quantity. The same thing had been attempted at Tarentum and other points. But the experiment at Tidioute was the only one that reached the oil-producing sand, which was found at a depth of 160 feet. The miners worked in squads, eight-hour turns, under the supervision of a Mr. Hart. The oil rock had been reached, holes drilled into it at various angles and a considerable quantity of the conglomerate brought to the surface. When that squad of workmen came up there was some little delay before the relief prepared to go down, during which time the air-pump, employed to exhaust the gases from the pit and supply pure air from above, was stopped. Mr. Hart was seated on one of the timbers directly over the shaft when the men got ready to go down.

As was their custom one of the men lit a match, applied it to a taper and dropped the latter into the opening. The shaft had filled up with natural gas, escaping from the oil rock, and this was ignited by the burning taper. The explosion was terrific. The workmen were thrown violently in all directions, and lay for some moments stunned and motionless. Some were severely burned. When they re-

covered Mr. Hart was nowhere to be seen, but the flame was leaping from the mouth of the pit as high as the tree tops.

Mr. Hart's body was afterward recovered from the bottom of the shaft frightfully mangled, having bounded from beam to beam in its terrible descent. Further work on the enterprise was abandoned and the shaft was partly filled in and covered. After the death of the superintendent no one could be induced to work about the ill-fated excavation, mainly owing to a widespread superstitious belief that the calamity which had befallen it was a visitation of Providence—a rebuke to man's bold efforts to pry into the secrets of nature.

This belief may have been heightened by the declaration of an observer of the explosion, who stood on the opposite side in the village of Tidioute, and not far from the spot where Pierre had sat and dreamed on that golden autumn day. This veracious individual alleged that a bolt of lightning from the heavens had met this flame from earth at the tree tops just as the body of the unfortunate Hart reached that altitude, and that for a moment he saw the bodies of three men suspended in the air, though but one descended and plunged down the shaft.

Petroleum Exports for 1887.

A popular opinion has prevailed that the exports of petroleum and its products from this country in 1887 were much below those of 1886. From the official statement of Wm. F. Switzler, Chief of the Bureau of Statistics at Washington it appears differently. The total exports for 1887 aggregate 580,463,229 gallons as against 579,673,486 gallons in 1886, an increase of 789,743 gallons or 18,803 barrels. The exports for December, 1887, aggregated 49,891,451 gallons against 44,386,049 gallons in December, 1886, a gain of 5,505,402 gallons or 131,081 barrels. It is true that the exports of illuminating oil from the United States last year were 217,629 barrels less than for 1886, and there was a falling off in the export of naphthas. But the decrease in these grades is more than made up by the increase in exports of crude, paraffine, lubricating oils and residuum. The increase in the quantity of crude oil exported during 1887 as compared with 1886 was 4,306,079 gallons.

The value of the products exported in 1887 was \$45,231,988 as against \$47,016,695 in 1886, a loss of \$1,784,706. The exports for December, however, show an increase in value over those of November of about \$270,000.

Gas Plant Transferred.

A number of the citizens of Washington have purchased a controlling interest in the Mississinewa Mining Company, which supplies the town of Marion, Ind., located about sixty miles from Indianapolis, with natural gas. The company has a fine plant of four wells of good pressure and splendid staying qualities. The capital stock is \$100,000, of which the Washington people have secured \$80,000, which they purchased from the National Tube Works Company, by whom the plant was constructed. The town is already piped and the people using the gas for light and fuel.—*Washington Reporter*.

THE Tuna Oil Company held its annual meeting at Pittsburg and declared a quarterly dividend of four per cent., which was paid on the 3d of January.

BY WAY OF DREAMLAND.

OIL AND NATURAL GAS DEVELOPMENTS DUE TO SHADOWY DREAMS.

IN that half-way house of the brain, where the mind halts 'twixt sleep and waking, have been born phantasies that have left their imprint on the histories of nations. In all ages significance has been attached, by some, to those illusions of the half-resting brain called dreams, and the development of oil and natural gas is marked with instances where this faith has led to important results. In the early days along Oil creek the dream-book was to be found in every boarding house, and the price of "interests" was largely governed by the readings therein. Not that the heard-headed, practical men who built up the oil industry were believers in dreams as a class, for they were not. But hordes of superstitious adventurers swarmed in the region then who invested their money according to the interpretation of their dreams.

An instance of the location of a well on account of a dream is found in the history of the famous and erratic Coquette well, on the Hyde & Egbert farm, and perhaps its success added not a little to the faith which was placed in dreams at that time. In that instance a young man, jilted by a girl in a small town in Eastern New York, resolved to go to the oil regions. He dreamed the night after his refusal by the young lady that he stood in a wild mountainous spot alone. An Indian, hideous in war paint, sprang from a thicket and rushed toward him with uplifted tomahawk. He resigned himself to his fate, when the coquette who had jilted him appeared with a rifle, which she handed him and disappeared. He covered the Indian and fired. When the smoke cleared away the Indian was gone, but at the spot where he had stood there was a gushing oil spring. The young man went to the oil country, and while walking on the Hyde & Egbert farm with his brother, one day, he saw a spot just like the one of his dream, and on that spot the Coquette gusher was drilled, a well as coquettish in its production as the young lady for whom it was named was in her affections.

The Pleasantville field had its origin in a dream of Dr. James, in which he said the spirits told him where to find the rich deposit.

A recent instance was at Waterville, Ohio. A farmer dreamed that beneath his farm was a solid seam of gold. He was visited in his sleep by sprites, who told him to drill a well and he would get gold in great quantities. Being of a practical turn of mind he concluded that it must mean oil or natural gas. He told the dream to his neighbors, and each contributed a share of land to have the matter tested. They then tried to raise money to drill the well, but only succeeded in getting \$500. They finally offered a lease of the land and the \$500 as a bonus to induce some one to drill a well. A guileless appearing contractor closed with the offer, drilled a well, struck oil, and sold out for \$10,000 to the Vandergrifts, who have shut down operations indefinitely. The dreamer is still convinced there was money in the land, but is inclined to think the contractor got the lion's share of it.

A story is told of a Dutchman who drilled a well in the Oil Creek valley in the early days. He did not believe much in dreams, but he studied the dream-book.

When his well was down near where the sand should have been found, he became depressed in spirits and lost his customary cheerful manner. He feared he would get a dry hole, he said, and wanted to sell out, but no one wanted to buy. One morning he related a dream which he said he had had the night before. When he went out his landlord and landlady looked up the dream-book. He had dreamed the best dream in the book. But he was still looking gloomy when he sat down to dinner. The landlord inquired about his prospects, and he said he feared they were bad. Then the landlord asked him how much he would take for the well. He figured up the cost of the well and said he would sell for that amount. Chmeking at the prospect of buying so good a dream at such a bargain, the landlord counted out the money. After two days' drilling the well was measured up and it appeared that it must have been considerably below sand level before the transfer was made, and that the Dutchman had not studied the dream-book in vain.

NATURE'S GIFT.

FIRST UTILIZATION OF NATURAL GAS AND SLOW PERCEPTION OF ITS GREATNESS.

BY C. C. CAMP.

FOR many centuries upon the altars of Eastern superstition there has burned a fire—the free gift of nature—without awakening in the minds of the votaries at the shrine the slightest suggestion of the importance of its symbolism. For three-quarters of a century, in full glare of the civilization of the nineteenth century, the same lambent flame has put forth a feeble glow without awakening any perception that within the circle of its radiance were the power and potency which would revolutionize all civilization. Though little generally known a little village in the western part of the State of New York was the first in modern times to make use of natural gas as an illuminant. As though to maintain the proprieties this new-found friend of progress, which is in itself the embodiment of beauty, so far as light and heat are concerned, was brought to light, to be light and delight in a village of beautiful walks and drives, of beautiful trees, lawns and flowers; of beautiful women, girls and boys—the village of Fredonia, which, like a full blown flower, rests upon the banks of the Canandaigua.

In the teens of the present century one Star on attempting to dig a well for water found a pesky vapor which came up and spoiled his water, and threatened to make his labor of no avail. Not wishing to be outdone he made a rude gasometer and collected enough gas to light two or three stores. The knowledge of this novel experiment went abroad and so much impressed the distinguished philosopher, warrior, statesman, the Marquis De LaFayette, who was visiting the United States in 1824 as the invited guest of the people of this country that he braved the long and tedious journey to Fredonia by the then primitive means of travel to behold this marvel of nature's bounty. The perception of a great mind of the importance of this discovery and which might well have been considered a prophecy of its future, created very little impression upon those who lived perpetually in the light of its presence and little was done except to gather a few

thousand feet and with this furnish light for a larger portion of the town. It remained for other circumstances and other conditions to awaken men's mental preceptions to the possibilities which underlie the presence of a power whose source is illimitable, whose duration is incomprehensible. Examination shows that the source of this gas is in the carboniferous shales of the lower Devonian. These shales, many thousand feet in thickness, containing from thirty to sixty per cent. of carbon (the ever present basic element of all vegetable and animal life), extending over an area almost incomputable, coming up at a sharp angle, are cut through by erosions of water leaving their edges more or less exposed.

Down in the depths of this store-house of nature, where are heat and other vapors, are constructed the workshops of nature wherein since Orion first sang to Pleiades (or very soon thereafter) has gone on the secret, silent fermentation and combination of this element—this modern Hercules—which, coursing its way up through these laminated strata, has age upon age been wasting power sufficient to have met all requirements of all the earth. As they come up towards the edge of their formations we find everywhere erevices and upheavals which evince the wrestle of earth in the embrace of earthquakes, through which this gas finds escape, perhaps to avoid the penalties of too great confinement. As though nature were inviting man to partake of her bounty, everywhere on the edge of the shales can be had, for the expense of boring a few hundred feet, some portion of this gas. Let concentrated effort be used, as is now being done in some places, to gather and utilize the same and it will require a vivid imagination to measure the impetus which will be given to the wheels of industry. Man stands on the shores of possibilities and his little vision scarcely penetrates the wonders and glories around and above him. In these bounties are no suggestion of niggardliness or stint. Let men turn their attention to garnering these bounties in place of "gathering where they have not strewn;" let them waken to interpret every invitation of nature to higher conditions for human nature, instead of appropriating by art or device the fruits of each other's toil, and they will awaken to conditions where peace and plenty are the perfect fruition.

Stocks in Foreign Ports.

THE total stocks at the seven Continental ports on Dec. 31, 1887, were 307,000 barrels; London, 90,208 barrels, making a total of 397,208 barrels. At the close of 1886 they were 599,436 barrels. The totals at the close of a number of years past are tabulated as follows:

	Barrels
1887.....	397,208
1886.....	599,436
1885.....	771,379
1884.....	1,280,416
1883.....	1,766,180

From the above figures it will be seen that the stocks at London and the seven Continental ports were 202,228 barrels less at the close of 1887 than at the end of 1886.

NATURAL gas was successfully used for smelting crude ores in a blast furnace at Pittsburg recently. Its general introduction in the furnaces of the Pittsburg region would be a heavy blow to the coke industry.

Thus both drill and rope are bouyed
up by a force equal to..... 3,142.5 lbs

Leaving as working w'g't of drill only 744.0 lbs
or one third of the weight employed when the
tools are not impeded by water.

It would not be surprising if this stratum should be found to terminate in a bed of solid rock salt. After an impervious stratum shall have been reached again, the whole of the present drill-hole will be encased with an iron casing, leaving 5½ inches clear for further drilling. This will shut off the present source of salt water. Should there be no further water-bearing rocks found, the drill will go on without interruption through the rest of the limestone series and through the shales until it reaches the coveted Trenton limestone. But experiences in Ohio give rise to fear that the troubles of the drillers of our gas well will not end so soon. However, let us hope for the best and let us, for the time, fondly imagine that by Christmas of next year our fires will be fed by our gas from a mighty Presque Isle gasser.

OUR GROWING TRADE.

GREATER HOME AND FOREIGN CONSUMPTION AND DECREASING PRODUCTION.

EVERY year the *Shipping and Commercial List* gives a review of the market which is of unusual interest to the region on account of the space given to the foreign situation and the export trade. In the article below a number of points or questions which have worried the region are settled to the satisfaction of the New York and Pennsylvania operators if the decisions given are not revoked at some time in the future. The verdict which is made on Lima oil below, if correct, and it is given without any qualifying remarks, will quiet the fears of many operators. They will also note with pleasure that the home consumption increased about 12 per cent. and is estimated to be 10,000,000 barrels in the year of 1887, a daily average of 27,397 barrels.

The view of Russian oil is endorsed by the statements of exporters at the seaboard. Mr. Ackermann, of the firm of Meissner, Ackermann & Co., said to a representative of THE PETROLEUM AGE that Russian oil would not displace American refined in the markets of the world west of Greece and exclusive of the Black sea if the American oil was sold for twelve cents per gallon. The figures of the exports of oil from Russia show an increase of 9,856,610 gallons in 1887 over those of 1886.

The following is their review:

The salient features of the market for the year 1887 may be epitomized as follows: A steady and marked decrease in production. A radical decline in prices of certificates, touching the lowest yearly average ever reached. A shut-down of about one-third in production, followed by a "boom" in certificates. A small increase in exports, and a large increase in home consumption.

PRODUCTION.

The one fact that has attracted the undivided attention of all connected with this industry, and the significance of which can scarcely be exaggerated, is the steady and assured declining tendency of the production of crude oil. This tendency was as plainly manifest during 1886 as during the past year, but the decline then was temporarily interrupted by the discovery of four new pools, which materially augmented the

year's production, although a marked decrease began again in September, continued throughout the remainder of the year, and has been even more marked during the current year, as shown by the appended table of runs and deliveries for the year. The decline receives greater emphasis from the fact that extra efforts were made during the greater part of the past few years to find natural gas. But the actual drilling for both gas and oil, resulting in an immense amount of property being condemned, utterly failed in even temporarily checking the decline during the past year, the production having steadily fallen to between 50,000 and 60,000 barrels per day, against 110,000 barrels in 1882. And this, too, in the face of an increase in consumption from about 60,000 barrels per day in 1882 to about 78,000 barrels in 1887. During the early history of the Lima fields much was hoped for from that source of supply, but experience has unmistakably demonstrated the fact that the product of this field as an illuminant is worthless. About 26 per cent. of illuminating oil has been obtained from the Lima crude, but it is so profusely impregnated with sulphur and other still more obnoxious odors that their elimination has been found to be impossible. After being distilled four or five times the Lima product has been made to seem merchantable, but unless used almost immediately after refining, it invariably becomes so offensive as to render it worthless, so that it has finally been abandoned as an illuminant, and is being used only as fuel.

The old reliable "Bradford" and "Alleghany" districts, from which the stocks were run up to 39,000,000 barrels, have yielded only meagre supplies for some time, and it is upon their decline that the apprehensions which have been for some time entertained regarding the future of this great industry are predicted. Notwithstanding the active efforts which have been put forth on every hand to increase the production, it has continued to steadily decline, with temporary intermissions, for some years. By far the most significant facts connected with this industry are those contained in the history of production; especially as connected with these—the two greatest oil producing fields ever discovered, or that in all probability ever will be discovered. The total production of the Bradford district since its discovery amounts to the enormous aggregate of about 140,000,000 barrels, and it was from the heavy yield of this field—which at one time averaged 60,000 barrels per day, and which sometimes ran as high as 100,000—that the immense stock of 39,000,000 barrels was accumulated, from which there is now being drawn 1,200,000 barrels per month—necessitated by the large decline in the total yield. The Alleghany fields have yielded in all about 22,000,000 barrels more, making the enormous production of 162,000,000 barrels from these two districts alone, while the White Sand pools during the past eight years have yielded only 26,947,315 barrels more. Both of these fields have materially declined year by year, until during last year Bradford added to her previous yield only 7,700,000 barrels and Alleghany 1,700,000 more. In the Bradford district about 16,000 wells have been drilled, of which about 14,000 were producing at the time of the shut-down, yet with only the meagre result above stated. In view of the rapid decline in production, and especially in the Bradford and Alleghany districts,

taken in connection with the poor results from the very active drilling for both oil and gas during the past several years, with the immense tracts of what was regarded as productive land condemned, the future of this great industry does not seem to give promise of any such rich harvests as have been garnered in the past, even though there be not ground for grave apprehensions of its rapid decline.

The number of wells drilling, averaging about 580 for about ten years, fell to 100 in October last, and yet in face of the alarming decline in production, prices of certificates have ruled abnormally low, so low that some radical expedient was deemed necessary by the producers in order to avert wide-spread disaster. Hence the major part of the producing interest became crystalized in a determination to arrest the decline in prices, and, if possible, bring about a better condition of the trade, and put the industry once more on a paying basis. An organization of the principal producing companies, styling itself the "Producers' Protective Association," was the first result, and the checking of production with the view of occasioning an advance in prices, the next. With this view, according to general belief, this association contracted with the Standard Oil Company, in brief, not to drill any wells, not to stimulate the production of old wells by the use of nitro-glycerine, by cleaning them out, or by any other means, for a period of one year from the first of November last, during which time they are to limit the producing wells to the extent of about one-half of their capacity. The result of this would be practically to reduce the aggregate production of the country by about one-third. The contract is secret, but its terms are generally believed to be about as here stated. The Standard Oil Company, it is also believed, agreed, among other things, to hold 6,000,000 barrels of crude oil for the benefit of the Association for the term of one year, and to divide amongst the several companies forming it, pro rata, as to the proportion of production they had shut in, the profit on 6,000,000 barrels crude, over and above its accredited cost at 62 cents per barrel. The effect of this arrangement became immediately manifest in the generally improved situation. The production in November averaged 38,659 barrels; in December, 42,918 barrels. The consumption averages 75,000 barrels per day the year round, and at this season of the year is fully 85,000 barrels; so that if the entire production of 40,000 and 42,000 barrels per day is disposed of it still falls 40,000 to 45,000 barrels per day short of the consumption and the stocks must suffer depletion to just this extent. Besides this, we are assured by those who have been constantly in the field and on the lookout for new sources of supply, and who are, therefore, in a position to know, that for the first time in the history of the trade, there are no new fields accessible, so far as known. Therefore, the statistical position of oil, it would seem, afforded basis for a substantial advance of certificates from the extremely low figures which marked more than three-fourths of the past year, entirely separate from and independent of the shut down agreed upon between the association and the Standard Oil Co. In fact, the abnormally low prices for certificates was the result of speculation, just as the recovery has been, although the one, apparently, had no just nor substantial

basis, while the other has. Consumption had largely outrun production for a long time, yet the speculators succeeded in running prices down until finally, in July, they touched the lowest figures (54 cents) of the year. The stock for the last two months was being reduced at the rate of about 1,200,000 barrels a month, yet the speculators, reluctant to relinquish their income from short sales, continued to remain short of very large amounts of certificates, sold at prices much below current quotations, and while the storage of 25 cents per day per 1,000 barrels and interest at the rate of 6 per cent. per annum represents a cost of carrying of something over 38 cents per 1,000 barrels per day, the actual carrying rate ranges from 10 cents per 1,000 barrels per day for carrying, to—in exceptional cases—\$1.25 paid for the use of certificates. Probably something like 1,500,000 and 2,000,000 barrels have been borrowed daily in the New York Exchange alone for some time past at below the actual storage rate. The stocks of oil, or in other words, certificates, are being rapidly reduced, so that selling short now is tantamount to selling government bonds short, which are being called in every month for cancellation.

CONSUMPTION.

Refined petroleum as an illuminant, because of its considerable brilliancy and relative cheapness as compared with all other illuminants, is rapidly growing in favor, while the fields of its usefulness are steadily extending, especially in the direction of the use of refined oil. The extension has undoubtedly been greatly facilitated by the exceptionally low prices that have obtained—lower than ever known—having ranged below 7 cents per gallon for barrel oil during the entire year, if we except the last day or two, when in view of the “boom” in certificates, prices advanced to 7½ cents. Although the increase in the home consumption cannot be accurately stated, it may be safely put at 12 per cent. over the previous year, with the probabilities favoring a still higher figure. With such an increase in consumption and an almost corresponding expansion of territory into which it has been introduced, the extremely low prices which have obtained and the relatively small accruing profits to both producer and refiner for 1887 may herein have found their compensating advantages. The total home consumption for the year 1887 may be safely computed at as high as 10,000,000 barrels crude equivalent.

EXPORTS.

It will be seen by reference to our comprehensive and complete table of exports, appended, that the shipments of petroleum though showing a slight falling off from New York, as compared with the exceptionally heavy shipments for 1886, are still large, and to many points show a very gratifying increase. The decrease hence is mainly in shipments to the far away ports of East Indies, China, Japan, etc. To Europe they show an increase notwithstanding the fact that stocks there are lower at the current writing than for many years.

Refined—The shipments hence for the year to Great Britain are about 51,500,000 gallons, against 52,000,000 last year; to Germany they showed a very large increase, aggregating 75,000,000, against 64,000,000 last year. Belgium and Africa also showed a gain, but to India and Siam, China, Japan and the East Indies

there has been a falling off. The total exports of crude equivalent from all ports show a slight increase as compared with the previous year, as shown below. The range of prices for refined oil together with the average price for the year were the lowest ever recorded. The whole range was from 6½ to 7½ cents, and the average for the year 6¾. In the first ten months of the year the price did not reach 7 cents and up to the end of August did not exceed 6½.

Crude—The exports of crude from this port to France show a falling off of about 3,000,000 gallons, but to all other ports combined an increase of about 1,000,000, leaving a net decrease of a little under 2,000,000 gallons. The range of prices for crude was also lower than ever before, reaching from 5½ to 6½ cents with an average price of 6.15, as against 6.35 in 1886 and 7.16 in 1885. The following table shows the exports of crude equivalent from all shipping ports in the United States:

	Galls. 1887.	Galls. 1886.
New York.....	479,654,495	499,226,483
Philadelphia.....	193,779,717	182,764,718
Baltimore.....	12,741,061	16,740,323
Boston.....	5,609,544	4,246,003
Perth Amboy.....	22,434,260	8,109,400
St. Louis (to Mexico by rail, estimated).....	1,683,540	1,145,213
Grand Total.....	715,902,617	712,232,140

CRUDE CERTIFICATES.

The year just closed is probably destined long to be remembered as one of unparalleled interest to the trade, unequalled fluctuations in all the markets, and as what is undoubtedly the turning point in this great industry. It will also be remembered as the year of the lowest average price known in the history of the trade. The range of prices at the Petroleum Exchange was from 54 to 90½ cents, with an average price for the year of 66¾, against 71½ last year; and these figures obtained in the face of a statistical position of the industry which, the year through, actually tended to the other extreme, for the consumption steadily increased while the production much more rapidly decreased and the stocks were being rapidly depleted! All through the summer the market “dragged its slow length along” without seeming life, until July recorded an average price of only 59 29-100. From that there was a recovery, so slow as to be hardly noticeable, until in October, when there were whisperings of some movement in the line of self-preservation on the part of some of the largest producing companies and the Standard Oil company. These rumors had their basis in a movement which culminated in an agreement to control production—(referred to elsewhere)—for one year from the 1st of November. When this became known a “boom” was started which carried prices up, with brief reactions, to 90½ cents, and heavy daily transactions were recorded at the Exchanges all over the country. How high prices are likely to go it is not our province even to conjecture, but it seems certain that if ever a “boom” had a solid basis that in progress in petroleum at the close of the year 1887 had. Judging from the past, the statistical position would seem to warrant a considerably higher range of prices than has as yet been reached, and unless the signs are more than usually deceptive, the recovery will prove not only a healthy one but lasting. The total sales at the New York Consolidated Exchange for the year 1887 were 1,254,765,000 barrels, against 2,286,765,000 in 1886.

RUSSIAN OIL.

As was promised in our last annual statement the past year has served to further demonstrate the impracticability of successful rivalry on the part of Russia as a producer of petroleum, despite all the efforts which have been put forth to stimulate the growth of the industry within her dominions. In the first place the increase in production has not been at all commensurate with the increased consumption; on the contrary it has proved comparatively insignificant. With existing limitations to her means of transportation in the oil territory, the extreme length and consequent great expense of railroad hauls, the absence of a system of pipe lines, &c., taken in connection with the fact that the Russian crude yields such a small per centage of refined oil (one barrel in three) as compared with the product of this country, there would seem to be little basis for apprehension of serious rivalry from that source for some time, if ever. Appended are the exports of Russian oil for ten months of the year:

	Gallons.
Turkey.....	7,775,110
Fiume, Austria.....	11,127,890
Trieste, Austria.....	7,693,600
England.....	5,213,720
Belgium.....	4,748,900
India.....	6,422,140
France.....	2,159,450
Italy.....	1,099,150
Germany.....	3,379,935
Roumania.....	923,450
Bulgaria.....	179,300
Egypt.....	3,226,990
Holland.....	641,500
Spain.....	40,000
Malta.....	120,000
Burmah, Rangoon.....	738,000
Total.....	55,487,185
To Russia.....	7,129,050
Total.....	62,616,235
Same time in 1886.....	52,759,625
Increase in 1887.....	9,856,610
Increase made up as follows:	
Increase for export.....	12,064,890
Decrease to Russia.....	2,208,280
Total.....	9,856,610

Crude Market for December.

There was more activity in the speculation in crude certificates during December than any other month of the year 1887. The statistical showing of the results of the first month's operation of the shut-in and shut-down movement started an advance on the first day of the month that grew as the month waned, culminating just after the Christmas holiday at 90½c, the highest price of the year. The bears were surprised at the strength shown just before the holiday, which is ordinarily a time of weakness, and a rush to cover carried values up quite rapidly. The opening price of the month was 74½c, the lowest, which was touched the first day, was 73½c, and the closing price of the month was 85½c.

THE CLEARANCES.

Exchanges.	December. Barrels.	November. Barrels.
Bradford.....	43,778,000	35,346,000
Oil City.....	52,354,000	36,966,000
New York.....	139,446,000	86,026,000
Pittsburg.....	82,674,000	53,281,000
Total.....	318,252,000	211,619,000

THE first natural gas company was organized in Bradford less than ten years ago. The combined capitalization of the active natural gas companies in this country now aggregates over \$50,000,000. This rapid growth is equalled only by that of the oil business, and the development of both has been principally in the hands of the same men.

THE PRODUCING REGION.

THROUGH the energetic work of the Producers' Protective Association in checking the work of the drill, the report of field operations at the close of December was the most bullish of the year. At this time there were fewer rigs and drilling wells in the region than there have been at any time since November, 1884, and with the exception of this month the volume of new work was smaller than it has been in the past 13 years. Throughout the New York and Pennsylvania oil regions 99 wells were completed in December, having an estimated new production on the last day of the month of 1,193 barrels. Of the whole number of wells completed 29 were dry. In November 104 wells were finished, with a new production on the last day of that month of 1,687 barrels. A comparison of figures shows five less new wells, a decrease of 490 barrels in new production and 14 less dry holes.

By means of the following summary the wells finished in December can be compared with those completed in November:

	DECEMBER.			NOVEMBER.		
	Wells.	Prod.	Dry.	Wells.	Prod.	Dry.
Allegheny.....	2	13	1	1	5	1
Bradford.....	3	3	2	2	12	1
Middle Field.....	13	105	19	19	57	12
Venango.....	35	142	8	44	164	12
Clarion.....	2	3	3	3	..	3
Butler and Armstrong.....	41	878	16	25	1374	7
Washington.....	3	53	1	8	75	..
Shannopin, etc.	0	0	0	2	0	2
Total.....	99	1197	29	104	1687	43
Total Nov.....	104	1687	43			
Difference..	5	490	14			

Following is the summary of rigs and wells drilling at the close of December as compared with the figures at the close of November:

	DEC. 30, 1887.			Nov. 30, 1887.		
	New Rigs.	Wells Dr'g.	Total.	New Rigs.	Wells Dr'g.	Total.
Allegheny.....	2	2	4	1	1	2
Bradford.....	1	4	5	1	5	6
Middle Field.....	4	11	15	3	9	12
Venango.....	6	25	31	15	25	40
Clarion.....	1	2	3	1	3	4
Butler & Arm.....	16	30	46	21	59	80
Washington.....	8	10	18	3	13	16
Shannopin, etc.	3	6	9	3	4	7
Total.....	41	90	131	48	122	170
Total Nov. 30.	48	122	170			
Decrease.....	7	32	39			

It will be seen from the above there are eight less new rigs, a reduction of 41 in the number of drilling wells and a decline of 49 in the total of field operations.

The following table shows the lowest ebb of operations for each year since statistics of this kind have been regularly compiled:

	Rigs.	Dr'g.	Total.
1875 August 31.....	47	103	150
1876 June 30.....	127	142	269
1877 July 31.....	268	349	617
1878 September 30.....	223	182	405
1879 August 31.....	287	217	504
1880 June 30.....	420	417	837
1881 August 31.....	371	368	739
1882 December 31.....	123	139	262
1883 January 31.....	149	139	288
1884 November 30.....	33	85	118
1885 January 31.....	69	113	182
1886 December 31.....	74	239	313
1887 December 31.....	41	90	131

The work under way at the close of this year will be seen to be smaller than at any time during the past thirteen years with the exception of the close of November, 1884, when the total of new

rigs and drilling wells was only 118. This was near the close of the shut-down movement of three years ago and at a time when the depression of prices brought about by the Thorn Creek field tended strongly to a cessation of work at all points in the field except Thorn Creek itself, and that pool had not progressed far enough to have much of a rig and drilling list.

The statistical review presented below contains many points of interest worthy of intelligent and careful study. The varying proportion of dry holes to the total number of wells drilled marks the transition of the scene of activity from the white sand fields to the great brown sand areas of Bradford and Allegheny and back again to the white sand pools. The percentage of dusters this year is the largest of the years from 1877 as shown in the table, excepting that year. The next largest percentage is that of last year.

The following table shows the number of wells completed each month during 1887, the number of dry holes and the estimated new production of the wells on the last day of each month:

	Wells Comp'd.	Prod'n.	Dry.
January.....	129	3707	37
February.....	147	8061	24
March.....	133	3787	44
April.....	169	6238	43
May.....	146	3182	36
June.....	179	6380	35
July.....	162	2093	35
August.....	152	6847	37
September.....	130	2304	34
October.....	114	2576	29
November.....	103	1687	41
December.....	99	1197	29
Total.....	1693		424

The following table shows the operations at the close of each month during the year 1887:

	New Rigs.	Wells Dr'g.	Total.
January 31.....	78	196	274
February 28.....	66	172	238
March 31.....	80	163	243
April 30.....	79	158	237
May 31.....	81	161	242
June 30.....	67	138	205
July 31.....	66	143	209
August 31.....	56	132	188
September 30.....	56	121	177
October 31.....	69	133	202
November 30.....	48	122	170
December 31.....	41	90	131

The subjoined table gives the total number of productive wells, total number of dry holes and total of wells completed during 1887 and 1886 by months, and the total number of wells completed and dry holes from 1877:

	1887.			1886.		
	Productive.	Dry.	Total.	Productive.	Dry.	Total.
January.....	122	37	159	220	45	265
February.....	123	24	147	230	35	265
March.....	89	44	133	246	50	296
April.....	126	43	169	295	58	353
May.....	110	36	146	294	57	351
June.....	144	35	179	316	56	372
July.....	127	35	162	312	46	358
August.....	115	37	152	286	42	328
September.....	96	34	130	217	36	253
October.....	85	29	114	217	62	279
November.....	61	43	104	171	45	216
December.....	70	29	99	137	52	189
Total.....	1268	426	1694	2941	584	3325
Total 1886.....	2941	584	3325			
Difference.....	1673	158	1631			
Total wells comp'd 1887.....	1693			Total dry.....	424	
" " " 1886.....	3325			" " " 1887.....	584	
" " " 1885.....	2857			" " " 1886.....	376	
" " " 1884.....	2309			" " " 1885.....	254	
" " " 1883.....	2886			" " " 1884.....	232	
" " " 1882.....	3269			" " " 1883.....	180	
" " " 1881.....	3848			" " " 1882.....	180	
" " " 1880.....	4194			" " " 1881.....	135	
" " " 1879.....	2889			" " " 1880.....	160	
" " " 1878.....	3018			" " " 1879.....	327	
" " " 1877.....	3954			" " " 1878.....	657	

ALLEGANY.

Two oil wells were completed in Allegheny during December, and they have an aggregate production of 13 barrels. In all parts of the field there were 2 rigs up and building and two wells drilling for oil, making an aggregate of 4. In the field the shut-down continues with unbroken lines and there is unwavering faith in the ultimate success of the plan.

The average daily pipe line runs from the Allegheny field in 1886 were 6,243 barrels, and in 1887 4,555 barrels.

BRADFORD.

The Bradford producer can sell a portion of his oil for a price above the average of last year, and with the stocks partially wiped out he hopes to part company with that which is being tanked under ground at a good figure. Three wells are in the completed list and only one of them, which had not tapped the sand when visited by our reporter, is estimated to be an oil well. The list of rigs and drilling wells was reduced to a low figure. There was 1 new rig and 4 drilling wells making a total of 5. The average daily production of the field for November, as based on pipe line runs and stocks at wells, was about 13,654 barrels. For years the old Bradford district has not regained during the summer months what it has lost in the winter. In the southern part of the county and west of the Wilcox gassers, Armstrong and others are looking for oil. The parties who wait for the shut-down to disintegrate first in Bradford are sure to grow weary waiting. With a single conspicuous exception the rank and file on this question is unbroken.

The average daily pipe line runs in the Bradford field during the year 1887 were 20,722 barrels, against 26,980 in 1886.

THE MIDDLE FIELD.

The section of country between McKean county and Venango shows a decline in the number of wells finished. In Highland township, Elk county, which is one of the new fields developed in the year 1887, four wells were added to the producing list. Down in this section, which is somewhat isolated from the highways of travel, it has been rather slow work to bring some parties into the shut-down.

Dr. Van Scoy's well on the Bliss farm in Hamilton township struck quite a heavy vein of gas in the upper sands and is now shut down. At Kinzua village, or rather at the northeastern end or in line with the streak which crosses the river, Fogle & Co. are drilling a well on the Harris farm. Operators are figuring on finding a new pool to the northeast of the two which have been developed on the river. The top of the sand in the pool on the eastern side of the Allegheny river is from 37 to 43 feet below that of the one on the western side.

James Welch has sold his property southwest of Balltown and there are no rigs or drilling wells in that section. Captain Haight, the contractor who drilled the Shannon mystery on Cooper hill, had the only well drilling in the Cooper district. It is located 500 feet west of the old Reno well. The Middle field, the land of white sand and sensational developments, is fairly in the shut-down.

Since the first of the month Armstrong & Co. have completed their second well on lot 3212 and found it to be dry.

VENANGO.

The shut-down struck in on old Ve-

nango in December. In November it did not seem to be affected. In November this section finished 44 wells, and had 16 rigs and 25 drilling wells at the close of the month. During December, 35 wells were completed in the county, and the new year finds only 6 new rigs waiting for cable and tools, though these are being used at as many as on the last day of November. A production of 164 barrels was developed in November and 142 barrels in December. The most active point at the opening of the month was the Slab Furnace district, which then had a total list of 16, and this dwindled to a total of 5. At Six Points and Emlenton the list shrunk almost out of sight, and by another month will be down to about one old rig and a drilling well, as Fox & Morgan have announced their intention to shut down. The greatest activity is now in the vicinity of Pleasantville, where some producers are pursuing fickle fortune in the way of drilling cheap territory for very small wells. At Hall's Run half a dozen small wells were completed and 2 were drilling, but as they have to go nearly 300 feet deeper than the Pleasantville people they do not display the same anxiety to perforate mother earth.

CLARION.

Old Clarion keeps time with the slow music of the drill during the shut-down. Our correspondent writes from Edenburg: "Producers generally, especially those interested in the shut-down movement, are well satisfied with the progress made thus far and there is every indication that the plan will be well sustained in this section during the year."

On the 5th of January the well drilling for gas on the Normal school lot in the old borough of Clarion struck an amber oil at a depth of 1,300 feet. The oil has much the appearance of that found in the Shannopin field, and has less of the green tinge about it than that of the old Clarion belt. There is some doubt as to whether the oil-bearing rock is the regular third or fourth sand. If it is a deeper sand than the regular third the numerous dry holes around the old borough are not tests for the country. There have been 13 dry holes finished about Clarion and three of them, the old Polly Hood, Fannie Hayes and Hahn well, on the Agey farm, are about a half mile south of this new strike on the Normal school lot. The well has been drilled about eight feet into the sand, and was stopped at this depth for fear of striking salt water deeper in the sand. The fact that the other wells in this locality found salt water in the sand in which they had a showing of oil, and this well is stopped in the producing sand for fear of meeting water, would indicate that the oil comes from the same horizon in which some of the failures in this neighborhood had a showing of oil.

The well was turned into the tank on January 7, and during the first week averaged about 25 barrels per day. On the 17th it was producing 22 barrels per day. Parties who favor the shut-down have secured the bulk of the lands about the well and they will not drill before next November.

BUTLER AND ARMSTRONG.

There were 41 wells completed in the Butler and Armstrong fields in December and 32 of this number are located in the Saxonburg district. The production of the 41 new wells for the last day of the month is estimated at 874 barrels. Fifteen of the number of wells finished are dusters. At Reibold Guck-

ert & White are drilling on the northern side of the belt on the Goering farm. They figure that the streak may bend more to the north with the winding Connoquenessing creek. A few experts are looking for a cross belt which shall cross the main belt and back down in a southeasterly direction.

On the 14th of January Schlegel's well on the southeastern corner of the P. Galebaugh farm was two bits in the sand, and for three hours during the afternoon of that day it averaged 20 barrels per hour, and for the first eight hours it did 125 barrels. Up to the 20th the well had not been disturbed and was flowing 10 barrels per hour. The P. P. A. will endeavor to shut the well down, as Mr. Phillips has lands on three sides of the lease. The new well is on the south side of the Reibold streak, about 700 feet south of the old Smick well. It will require more drilling in this section to determine what the leads from the well may be. The chances are that it is a pot or pool of minor importance.

The gauge of the Saxonburg field December 30th gave a production of 896 barrels. On Saturday, Dec. 24, 32 wells, old and new, in the pool were producing 1,380 barrels. The chances are that the Saxonburg field is pretty well defined, though there are some avenues to be closed on different sides of it. The first reports from Loan, Baker & Co.'s well on the Muder farm, located about 80 rods southwest of the old Jefferson Centre well, were contradictory. Outsiders placed the well at 10 feet in the sand and gave its production in the afternoon between six and seven barrels per hour. December 30th interested parties wired friends in Bradford that the well was showing all right and flowing at the rate of 12 barrels per hour. Thus far the Saxonburg pool has been a disappointment to all who have toyed with the fates by drilling within its confines. The Loan No. 2, on the Muder farm, 80 rods west of the old Jefferson Center well, at this writing, January 16, is in the sand and fishing.

The following table shows the production of the Saxonburg field by wells for the 24 hours ending Saturday morning, January 14:

Farm.	Operator.	Bbbs. per Day.
Widow Lonitz, Bolard, Greenlee & Co's No 1.		100
	No 2.	0
J. H. Lonitz.	No 1.	0
	No 3.	95
Battenfelder,	No 1.	0
Adler,	No 1.	0
	No 3.	25
Bauman Heirs,	No 1.	6
	No 3.	5
Seibert	No 1.	20
Bauman Heirs, Iman & Co	No 1.	5
	No 2.	5
	No 3.	3
Lonitz, Golden, Wuller & McBride No 1.		0
	No 3.	0
Pfabe,	No 1.	5
Aderhold, Golden, Wuller & McBride		
	No 1.	5
Aderhold, Golden, Wuller & McBride		
	No 2.	120
Adler, Troutman Oil Co	No 1.	10
	No 2.	10
	No 3.	25
Battenfelder, Extension Oil Co	No 3.	0
	No 4.	0
	No 6.	70
	No 8.	100
	No 9.	25
	No 10.	5
	No 11.	9
Seibert, Snec & Co	No 1.	0
	No 2.	12
	No 3.	4
	No 4.	20
Aderhold, Clark & Co No 1.		10
Adler, Urquhart, Lavens & Co No 1.		100
Forcht,	No 1.	50
	Haymaker & Co No 2.	15
Battenfelder, Fall & Co No 1.		10
Pfabe Heirs, Reiber, Yeakel & Co No 1.		0

Muder, Baker, Loan & Co.....	15	
Seibert, Gibson & Co.....	10	
<i>Time.</i>	<i>No. Wells.</i>	<i>Production.</i>
Jan. 14, 1888.....	40	894
Dec. 10, 1887.....	24	1684
Difference.....	16	770

On the 12th of November the 12 wells in the field were producing 3,078 barrels. The pipe line runs from the Saxonburg field up to the close of December were 96,977 barrels. Contrary to expectation the field has failed to get the best of the shut-down movement.

The following is the list of rigs up and building and wells drilling, with depths as they were on the 14th of January:

Farm.	Operator.	Depth.
J H Lonitz, Bolard, Greenlee & Co No 1.		1400
	No 4, rig bldg	
Adler,	No 2.	1150
Battenfelder, Extension Oil Co's No 7.		1600
	John A Snec & Co's No 5.	550
Crawford, Haymaker & Co's No 2.		1735
Rudert, Staley & McDonald No 1.		1650
Smalley, B B Campbell & Co.		1200
Aderhold, Golden, Wuller & McBride No 3.		400
Muder, Loan & Co No 2.		sand
Logan, Shaffer Bros No 1.		1200
Foercht, Starr & Davis No 1.		1450
Adler, Troutman Oil Co's No 4.		500
Gallagher, Burchfield & Co No 1.		1200
Crawford, Haymaker & Co.		150
Cochran, Calhoun & Co.		rig
Rudert, Reiber, Yeakel & Co.		rig
Helmhold, B B Campbell.		rig

Time.	Rigs.	Drill- ing.	Total.
Jan. 14, 1888.	4	14	18
Dec. 10, 1887.	12	38	50
Decrease	8	24	32

BRUSH CREEK.

Munhall & Co.'s No. 1 well on the Warren farm is packed and flowing 37 barrels per day. Their No. 2 on the Warren farm, 1,300 feet north of No. 1, has passed below the producing level of No. 1 and is a failure in the 100 foot rock. It is being drilled to the deeper sands. The Chartiers Oil Co.'s well on the Marshall farm over a mile to the northeast shows some irregularities in the position of its first oil indication. It is quite a heavy gasser, but is a failure as a producer of oil. The Munhall No. 2, which raised some hopes from its first showing of crude, has been placed in the list of failures. Burchfield & Co.'s well on the Duthil farm, located two miles southwest of the Munhall producing well, has been tubed and will make a producing well from the hundred-foot. This fact does not imply that there is a continuous streak of oil between these two points. A showing of oil was found in the third or fourth sand in a series of five test wells drilled between the Middlesex township well and Mount Nebo, which is an eastern range from that which is being followed in the Brush Creek section. In the Brush Creek region the Munhall No. 2 failed to find a sequel rock where the deep sand should have been.

GREENE COUNTY.

Mr. E. M. Hukill still has faith in the oil probabilities of Greene county. The Mount Morris well since it was torpedoed about a month ago has averaged in the neighborhood of 50 barrels per day. At the present writing there are 2 new rigs and 4 wells drilling in Greene county. But anything now begun will not interfere with the shut-down movement if it takes one-half the time required in putting down the other wells. There never has been any regularity about oil deposits in the Big Indian or Manifold sand in the Washington field and it remains to be demonstrated that Greene county will prove an exception.

WASHINGTON.

Outside of Cannonsburg there is but

little at the present time which will interest the speculator on the lookout for sensational features. Drilling at Taylors-town is within defined limits and operators for the present are not looking for anything new in the old field. The drilling at Cannonsburg is on the eastern and western sides of the Morganza property. The well on the Giffin farm is a small pumper. The old well on the McKowan farm found more oil in the Gordon sand. On the 14th of January is producing 25 barrels of oil per day. Fisher's well on the Buchanan farm, 1,000 feet northeast of the McKowan well, is rated at 35 barrels per day. John McKeown's well on the Pollock farm, according to the best available information at this writing, is drilling between the fifty-foot and Gordon sand, and has a showing of oil in the upper rock.

The gauge of the Washington field for the 24 hours ending January 18 was 5,677 barrels.

OIL IN COLORADO.

REVIEW OF THE DEVELOPMENT AND PRESENT CONDITION OF THE INDUSTRY.

THE Florence Oil Refiner is the name of a new weekly paper published at Florence, Fremont county, Colorado. The initial number gives the following account of the oil companies of that place:

The Florence Oil Company was organized January, 1887, and is composed of the following gentlemen: A. H. Danforth, President; A. R. Gumaer, Treasurer, and Isaac Canfield, general Superintendent.

This company has already shown itself active in the development of the oil industry, having accomplished in nine months what formerly required years to bring about, viz.: a supply of "crude" sufficient to warrant the building of a refinery. This is due, of course, to the splendid flow of oil which the company has been fortunate enough to strike. Of the four wells this syndicate is pumping, two are, perhaps, equal to the best producers in the district. Two additional wells have recently been started and a number of other rigs built ready for the drillers. A "string" of new tools have been ordered from the East, which will be put to work as soon as they can get here.

This company's first well was drilled in February, and from that time on development work has been pushed with the utmost vigor. The refinery plant, of two stills in operation and two building, is complete and convenient for the business of refining oil. One feature is the improved residuum burner, made by Mr. B. B. Burton, Superintendent of the refinery. The company's storage capacity is 17,200 barrels in eleven underground cisterns, which are constructed of brick and well cemented, sides and bottom. The Florence company has about 8,000 acres of oil lands, which Superintendent Canfield informs the *Refiner* are to be developed as rapidly as capital and men can push it.

President Danforth, as everyone knows, is vice-president of the great Colorado Coal and Iron Co. There is probably not another man in the State more extensively engaged in developing her vast resources of coal, iron and oil than is Mr. Danforth, and everything he has touched has proven successful. A. R. Gumaer, formerly a merchant in New York city, and for the past six years,

cashier of the Exchange Bank of Canon City, is a practical oil man, having held the superintendency of the Colorado Oil Co. last year. Isaac Canfield is an experienced man in oil, having been a large producer in the oil fields of Pennsylvania at Titusville from 1861 to 1873. Nine years ago he came to Colorado, and seven years ago bored the first oil well at Canon City, where he drilled one thousand feet, but the formation being so very poor he found it impracticable to complete the hole. One year later Mr. Canfield, with old man Cassidy, in drilling for water near Coal Creek, encountered oil at a depth of 1,354 feet. This was the beginning of the oil business in the vicinity of Florence. Thomas McVey is head driller for the Florence, assisted by James Zorder, Charles Webster, Eugene Fitzpatrick, and "Rattler" White.

The Colorado Oil Company succeeded the Land Investment Coal, Oil & Mining Company, which was organized in 1882 with D. G. Peabody as manager. The first well was drilled on the farm of Edwin Lobach west of town. Drilling was begun in 1882 with the following force of men: Drillers, Wm. Cochran and Edward Andrew; tool-dressers, Gideon Crawford and Wm. Folsom. This well was completed in 1883 by Charles Lefever, as driller, assisted by Isaac Canfield and George Peabody. The well made a fine showing, but was ruined by "shooting."

Well 2 was drilled in 1883 and 1884 by Mr. Lefever, assisted by Besley Lefever. This also proved a small well, producing at first about 50 barrels.

The L. I. C. & O. Co. met with financial difficulties and was sold by the sheriff and bought in by Mr. D. G. Peabody, who sold out to the Colorado Oil Company in 1885. This company, under Mr. Peabody's management, sank wells No. 3 and 4. Mr. Peabody was succeeded by Mr. A. R. Gumaer in July, 1886, who continued to act as manager until December. During Mr. Gumaer's management No. 5, 6 and 8 wells were completed.

S. A. Josephi took charge in December, 1886, and under his superintendency wells 7, 11, 12 and 13 were completed; he increased largely the storage capacity of the company's plant; pipe lines were laid to the refineries; the product contracted for, and the company, for the first time since its organization, realized a profit from the enterprise. This organization, in July last, was merged into the Colorado Oil Trust Company.

With the view of protecting the oil interests of Colorado, the above company was formed in July, 1887. They bought the property of the Arkansas Valley Oil and Land Company, the Colorado Oil Company, and the oil interests of Senator N. P. Hill. This company has a paid up capital of \$3,000,000. The directors for the first year are N. P. Hill, D. P. Eells, J. Wallace, I. E. Blake, S. F. Rathvon, John Coon, and S. A. Josephi. The following officers were elected for the current year: N. P. Hill, President; D. P. Eells and J. Wallace, Vice-Presidents; S. F. Rathvon, Secretary and Treasurer.

This company has twelve productive wells; has the largest refinery plant west of the Mississippi river, and owns several thousand acres of oil lands. They are now drilling well No. 13 on Sec. 16, T. 19, R. 69 W. on State school lands. It oil is found: the royalty will be paid into the State school fund. The Colorado com-

pany is purchasing all the oil produced in this territory excepting the product of the Florence Oil Company's four wells. The company has above ground over 10,000 barrels of surplus oil, and refinery facilities sufficient to supply the demand of all the States and Territories tributary to this field.

Mr. Chas. H. Marr is Superintendent and Mr. H. L. Short foreman of the refinery. Mr. S. A. Josephi is Superintendent and Charles Lefever foreman of wells and production. The drillers for this syndicate are John Irwin and Albert Gallaher; assistants, Peter Worden and Besley Lefever. These gentlemen have all served an apprenticeship in the Pennsylvania oil fields.

Gas Company Election.

The stockholders of the Manufacturers' Natural Gas Company held their annual meeting January 17 in their rooms at the Lewis block. Much interest was felt in the session because of the trying experience which it was known all the companies had during the year past. There was also curiosity to hear about the oil territory of the company near Canonsburg, where several wells have recently proved the existence of a pool, from which a good deal is expected.

Joseph Abel, Esq., was called to the chair, and reports of the business for the year were presented by President Meyran and Auditor Roberts. They showed the company to have surmounted all its difficulties with credit, and to be in shape to begin dividends by February. During the year there was new pipe laid to the extent of about 20 miles, and expenditures were made upon the plant aggregating near \$150,000. An interesting report of the pressure per minute at each of the company's 12 gas wells, and also of the rock pressure, showed that there had been no serious diminution of the flow through the Canonsburg field.

The Manufacturers' Company has its principal business in the supplying of five large mills, those of Moorhead & McClean, the Keystone, the Linden Steel Works, H. Lloyd & Son and the Continental Tube Works. It has also several systems of low-pressure lines in the suburbs, and an extensive service for oil drillers through the Washington field. The stockholders felt very comfortable yesterday over its prospects. Directors for the ensuing year were elected, as follows: Charles Meyran, B. L. Wood, Jr., James McCutcheon, Henry Lloyd, Fred. Fisher, E. H. Meyers and E. M. O'Neill. —*Pittsburg Dispatch*.

Natural Gas in Canada.

OTTAWA, Ont., Jan. 18.—Mr. Thomas Wallace, the chief promoter of the Capital Gas Company, has returned from a trip through the natural gas producing regions of Pennsylvania and Ohio. A vast reserve of natural gas lies under the Merbleu, near this city, and the company has ordered machinery for boring, which will be commenced at once. Millions of cubic feet are going to waste every day, and still there appears to be no diminution of the supply. Mr. Wallace has brought with him samples of the burners and appliances used in the distribution of the gas, and has obtained much valuable information which will aid him in his efforts to develop the natural gas deposits which exist in the neighborhood.

OIL REFINERS SWAMPED.

GALLANT CHARLES B. MATTHEWS SUCCUMBS
TO ADVERSE CONDITIONS.

JUSTICE CHILDS, of the Supreme Court, January 16, appointed Mr. Charles P. Norton receiver of the Buffalo Lubricating Oil Company, limited, in an action brought against the company by the Manufacturers' and Traders' bank to recover \$2,542.77. Mr. Norton was directed to give a bond for \$10,000, says the *Buffalo Express*. The bank holds judgments against the company for about \$5,000, on which it is seeking to recover.

The appointment will excite considerable interest among oil producers and dealers. It will especially interest those producers and the general public who have watched the determined fight in progress between the Buffalo company and the Standard oil concern. The receiver's appointment, upon its face, appears to be an ordinary legal transaction, but it possibly involves matters of considerable importance to the small number of independent refiners, and much of the future success of independent antagonism of the Standard monopoly may depend upon the results following the adjusting of the affairs of the Buffalo company.

When seen Mr. C. B. Matthews, president of the company, explained that the embarrassment of the Buffalo company and other independent interests is the result, mainly, of Standard tactics. Said Mr. Matthews:

"At the time we began our business in Buffalo crude oil was cheaper than it is now, and refined oil was worth nearly three times as much as it is now. The independent oil interests established in Buffalo since our company came here have been the means of causing a net saving to the people of Buffalo of about \$500,000 by the lowering of prices of oil."

After detailing his struggles with the Standard, which have become quite well known through legal proceedings, Mr. Matthews said: "About a year ago was undertaken what promised to be a most important movement on the part of independent oil producers and refiners. The Keystone Oil Company, of Oil City, Pa., an independent concern, owned a pipe line in the Pennsylvania field, the cost of which was about \$70,000. The line was earning \$8,000 a month. The company was building a refinery at Oil City for the manufacture of paraffine oils. The Buffalo Lubricating Oil Company deeded its Buffalo property to the Keystone company for a consideration, which was to be \$60,000 worth of Keystone stock. The refinery at Oil City was finished. It is one of the most valuable independent refining plants in the United States. The affairs of the new combination did not run as smoothly as the affairs of an independent oil interest must to be successful. There were several oil producers in Buffalo. Cleveland, Corry and Oil City interested, and the subscribed capital amounted to \$225,000, the authorized capital being \$500,000. In September our Buffalo works were deeded back to our company. Shortly after the firm of Clark & Warren, Corry refiners, failed, involving the Keystone company, whose failure soon followed, with that of the Excelsior Refining Company of Cleveland, some of whose members were also interested in the Keystone. The Keystone is now in the hands of a receiver. The Buffalo

Lubricating Oil Company sold the Keystone oil and other products, and took notes in payment. The notes were discounted and now our company is sued by the banks as indorser. Our company would not be embarrassed had the Keystone met its obligations as it might have done. I cannot tell how soon we can resume business until I know what percentage on its debts the Keystone can pay.

"As soon as the Keystone company was formed," continued Mr. Matthews, "the Standard began an effort to harass it. The Keystone bought a lot of tank cars for use in shipping oil from Oil City to Buffalo. It took over three weeks on an average for a car of our oil to get to Buffalo. The cars were held and sidetracked by the railroads. The manufacture of oil was begun last February. Natural gas was used at the refinery. The supply was cut off, damaging oils in process of manufacture. There was plenty of gas for other refiners, but none for the independent ones. The Standard increased the price of benzine, etc., where the Keystone was forced to buy them. The premium on crude oil was raised to sixteen cents on the ground that the oil, which we got from the Tarkill field, was better than that from the Bradford field. It was not discovered that there was any superior excellence in the Tarkill oil until the independent pipe line was built. The Buffalo Refining Company, a new independent company of which I am manager, will supply the customers of the Buffalo Lubricating Oil Company until its affairs are settled."

It is possible, concludes the *Express*, that the new company will take the place of the Buffalo Lubricating Oil Company. If the old company continues business it will produce and the new company will sell oil.

To Stop the Fraud.

It is notorious that dealers in Russian oil have put their stuff in American barrels to get a sale for it under false pretenses, at the same time injuring the reputation of the American article with the consumer. On this point the following from the *Progressive Age's* London letter is of interest:

The last session of our Parliament having passed an Act dealing with mercantile trade-marks, the Council of the Petroleum Association has deemed it wise to obtain a legal opinion as to the effect of the new Act upon the petroleum trade. A case was accordingly submitted to the Attorney-General (Sir Richard Webster, Q. C., M. P.) and Mr. F. W. Hollams. These eminent lawyers have now reported: "Subject to the observations hereinafter contained, we are of opinion that the use of American barrels for the sale of Russian petroleum, in the case of the barrels being left with the original American brands upon them, is *prima facie* an infringement of the Merchandise Marks Act, 1887. Further, if, as we assume to be the case, the American barrels are recognized in the trade as an indication as to the place in which the contents have been produced, there is also *prima facie* an infringement where the American brands have been removed, but no new brand substituted. Where, however, the barrels are rebranded, we think that, assuming the new brand to show distinctly that the origin of the contents is not American, there is not an infringement of the Act, and that in such case it is immaterial whether the

new brand shows the Russian origin of the contents, or is one which is exclusively used for Russian petroleum."

PACKING GAS WELLS.

USEFUL INFORMATION ON AN INTERESTING
SUBJECT FROM AN EXPERT.

BY S. R. DRESSER.

THOSE who have the least trouble in packing gas wells are those who pack them at once, as soon as they are finished, not allowing the gas to go to waste for 24 hours. At that time the wall of the well is most likely to be free from any such materials as gather or adhere to it, to lessen the diameter of the bore, as such obstruction is sure to occur when a well is allowed to remain for some time before being packed.

Whenever the bore of a well is made smaller by material adhering to the well it is necessary to run down a round, hollow reamer, that is dressed out the full size of the hole, to clean off this material and make the well full size again before lowering the packer. If parties have no tools and it would cost too much to get them, this can be done by taking a four-inch tubing coupling, dressing one side of it out to the size of the hole and running it, on the tubing, to the bottom of the well. They can then draw out and put the packer on. If these precautions are always taken there will be little difficulty in packing gas wells. One thing is certain, a packer will not go down a hole that is less in diameter than the outside diameter of the packer. When the packer comes to one of these smaller places in the well the rubber is sure to be torn, the gas will get between the rubber and the pipe and blow the rubber off, which makes it necessary to pull out and ream the hole.

The end flanges of the packer should be within three-eighths of an inch as large as the hole to be packed. If they are much smaller it leaves too much space between them and the wall of the well, so that when the well is shut in and gathers a large pressure it is liable to force the rubber past the flanges and blow it out. Especially is this true with large packers where it is necessary to use thin rubber, as in using a packer with four-inch tubing through rubber to pack a 5½ inch hole. The rubber in this packer is but three-eighths of an inch thick, so if the flanges are much smaller than the well the gas pressure would easily force the rubber past them. After a well is packed the tubing should be anchored to the derrick before the gas is shut in. This gives a greater pressure on the packer and forces the rubber more tightly into the unevenness of the wall. It also prevents the tubing from being blown out, as it has been in a number of cases when this was not done.

The packer should always be put just above the rock in which the gas is obtained to get the full benefit of the rock pressure and to prevent the gas from escaping through openings or porous rocks higher up in the well, as has been the case where packers have been put just below the casing or only a few hundred feet down.

DAYTON, Ohio, is to be supplied with natural gas fuel from wells in Mercer county, that State. The supply pipe has been laid as far as Piqua, and the residents of that place are being supplied with the vapor, much to their satisfaction.

OBITUARY.

J. C. McMullen, publisher of THE PETROLEUM AGE, and one of the editors and publishers of the Daily Oil News, of Bradford, Pa., died at the age of 37 at his home in that city January 31 of pleurisy, after a brief illness. He leaves a wife and infant daughter. His untimely death will be very deeply and generally lamented. Until further notice THE AGE will be published as usual at the Daily Oil News office.

THE PETROLEUM AGE.

DEVOTED TO THE INTERESTS OF
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J. C. McMULLEN, BRADFORD, PA.

A. R. CRUM, EDITOR.

B. KUYKENDALL, JR., BUSINESS MANAGER.

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TO OUR PATRONS.

This number of THE PETROLEUM AGE appears late. We have no apology to offer except that the delay has been caused by the late arrival of the new material with which it is printed. And we hope the improvement wrought in the appearance of the magazine will atone for its failure to appear earlier.

CURRENT COMMENT.

We congratulate the producers of petroleum on the improved outlook for their business. Their treatment of the situation is heroic, but it seems good.

If the shut-down was brought to an end now it would still not have been in vain. The petroleum industry is in better condition now than at any time since the Cherry Grove torrent added the one more ill than it could well bear.

SINCE our last issue THE PETROLEUM AGE has received many complimentary notices from its exchanges, which it acknowledges gratefully. The AGE has also been more widely quoted the past month than ever before, which encourages it to believe that its contents are of some value in the world.

REMOVING the scene of activity from the rugged hills and valleys of Western Pennsylvania and Southern New York to the wide, level plains of Northwestern Ohio does not smooth the path of the enterprising oilman. Lina crude still sells at 15 cents a barrel, whether the producer has a thirty-day note out or not.

ENERGY is the one distinguishing characteristic of the people of the oil country; a cosmopolitan crowd, gathered from every nation and every clime; chosen ones who were not afraid to quit their old homes and brave battles of the fiercest competition. These are the people who, by their tireless industry, have done so much for the advancement of civilization as to give to the whole world a cheap light to read by; and having done this much they have now begun to warm the world with vapor and liquid fuel.

PERSONS who compare the shut-down in the oil region with the shut-down of mines and mills in times of over-production, should not lose sight of the fact that in most cases of this nature the workmen are simply thrown out of employment to shift for themselves, while the employers work off the surplus product for their own profit, while in this instance the oil well workers share in the profits from the sale of the goods. It being admitted that these workers have done more than a necessary amount of work in a specified time, it is deemed proper that they should not be compelled to starve while resting.

AN OLD TIMER.

INTERESTING REMINISCENCES AND LEAVES
FROM HIS DIARY.

BY C. L. WHEELER.

ON Nov. 14, 1860, I left New York for the oil regions of Virginia and Pennsylvania. Arriving at Parkersburg, Va., I presented letters of introduction to General S. D. Karnes, from whom the firm I represented had bought oil during the previous summer. Under his guidance I made the trip to Burning Springs, twenty-nine miles up the Kanawha river, and came face to face with the first oil well I had ever seen.

BURNING SPRINGS, Va., Nov. 20, 1860.

There are two producing wells here; one belonging to Mr. John Rathbone, pumping, they say, 40 barrels a day, the other owned by General Karnes, 40 barrels. I should judge that there are thirty wells drilling. The farm upon which these wells are located belongs to Judge Rathbone, and the lease under which they are operated provides, "that the land owner is to receive one-quarter of the oil in iron-bound oak barrels without expense to him."

On the way back we took dinner at Dick Timms' Half-way House. I wonder if any of the pioneers remember that old inn with its weather-beaten sign, bearing the legend in faded letters, "Rest For the Weary, R. Timms," its rough, broken-down, unpainted exterior and the homelike smugness of its interior? As we rode up to the door Uncle Dick in full uniform of shirt and pantaloons, barefooted and hatless, rough and uncouth in speech and appearance, but with a heart so big that it made his fat body bulge, his whole face lit up with a cheerful smile, stood ready with his welcome salutation of "Howdy, howdy; light; come in."

PARKERSBURG, Va., Nov. 28, 1860.

Shipped to New York by express to-day my trunk, evening dress suit, patent leather shoes, silk hat and hat box. Some way they don't seem to harmonize well with oil region surroundings.

During the trip to the Springs, lasting some two weeks, I formed the acquaintance of some gentlemen who have since become somewhat famous. General Rosencrans, who had been managing a small coal oil refinery at Cincinnati, was looking over the situation with a view to change his factory so as to refine petroleum if the supply was likely to last. Samuel Downer, of Boston, was having his first experience in the oil country with a similar object. The latter had made up his mind that coal oil must go, and that petroleum would be the oil in the future. In answer to the oft-repeated objection that the oil might soon give out, he wound up his argument with this clincher: "God never does a retail business." Ex-Senator Camden was then a pushing, energetic young man, interested with his uncle, Judge Camden, the latter being a large owner of real estate. The next spring, when the war broke out, the Judge cast his fortune with the rebels and went South, but the young man remained and was just loyal enough to keep the title good to the property. Later he became the representative of the Standard Oil Company in Maryland and Virginia, scooped in a few millions, and represented West Virginia in the United States Senate.

Having become fairly familiar with the prospect in Virginia, I left for "The

Creek" and reached Franklin, Pa., at midnight, Dec. 5, 1860.

FRANKLIN, Pa., Dec. 7, 1860.

Pittsburg refiners are offering 25 cents per gallon for oil delivered at Pittsburg, barrels returned.

TITUSVILLE, Pa., Dec. 8, 1860.

Pike, the Franklin liveryman, delivered me here, pretty well shook up and nearly talked to death, at 9 o'clock last night. Spent my first night "on the creek" at the American hotel, kept by "Pap" Hibbard. First breakfast consisted of bluish-white buckwheat cakes, fried salt pork, boiled potatoes and coffee. My appetite, always ravenous in New York, seems to be failing. Titusville has no bank, no telegraph, no railroad and no express office.

Dec. 9.—Well owners not anxious to sell; market nominally 20 cents per gallon, barrels extra at \$2.10 each. Teaming to Union Mills \$1 per barrel. The general impression seems to be that the price is too low. Made the acquaintance of Mr. Daniel Fletcher, who keeps a country store and owns a safe. He offered to keep my surplus money. I looked him over and from his appearance concluded that he would not "keep it" for good, so left it with him and got rid of one source of anxiety.

ERIE, Pa., Dec. 11, 1860.

Made my first purchase to-day, 100 barrels, delivered at Irvine, at 23 cents per gallon, barrels extra at \$2 each. This trade was made with the Crescent Oil Company, of Erie, who produce their oil at Tidioute.

TITUSVILLE, Pa., Dec. 13, 1860.

George Mowbray, agent for Schieffeline & Co., New York, is offering to pay 20 cents per gallon for all oil produced up to April 1st, 1861. There is not one-eighth of the oil produced that they talk about. Barnsdall, Rouse and Mead own three of the best wells in this vicinity, and their united production does not exceed 30 barrels per day.

BUCHANAN FARM, ROUSEVILLE, }
Dec. 18, 1860. }

Rouse, Mitchell & Brown offered to sell 200 barrels at 23 cents per gallon, barrels extra at \$2.25. Teaming from here to railroad \$1.50 per barrels. Think it too high and did not buy.

BUCHANAN FARM, Dec. 25, 1860.

Bought of Rockwell & Mitchell, (Foster Mitchell) 35 barrels at \$10, barrels \$2.10 extra; of Rouse, Mitchell & Brown 200 barrels, delivered at Mullengar (Garland), at \$12 per barrel, barrels \$2 extra.

Dec. 30.—Was offered 200 barrels to-day at Pithole (this was the mouth of Pithole creek, not the famous city of that name) at \$10 per barrel. Thought it too far from the railroad and did not buy.

With the opening of the year 1861 the business of oil buying became more systematized. The resident buyers on the Upper Creek were George Mowbray, for Downer & Co., of Boston; George Steele, for the Empire Oil Company, New York, and Byerly & Co., of Cleveland; Mr. Lincoln, for Philbrick, of Boston, and the writer for Cozzens & Co., New York. The buyers' position was no sinecure in those days. I usually left Titusville on Tuesday morning, taking as much money as I thought would be needed, and drive down the "Creek," stopping at all the wells, making purchases in lots from two barrels up, counting out the cash on the heads of barrels. My brother John, now at Titusville, would follow a day after and pick up the

odd lots and ship by teams to the railroad at Union Mills, Garland or Irvine.

The first night would be passed in Bill Benedict's boarding shanty on the Buchanan farm; from there the route extended to Tidouite, Irvine, Garland and Union Mills. At the latter point the nearest express office was located, from which the necessary supply of funds was obtained for another week's circuit. The week's traveling generally closed at Titusville Friday night or Saturday morning.

To give an idea of "the trade" in those "way-back" days, I quote from my day book the purchases for the first week in January, 1861. The difference in price was determined by the quality of the oil and the facilities for teaming. In all cases the barrels came extra:

T. Flemming, 20 barrels at \$8.50; Buchanan, 12 barrels at \$8.50; Hawley & Co., 26 barrels at \$9; Rev. Doobs, 13 barrels at \$9; Watsburgh Oil Company, (represented by J. W. Fritts, now of Bradford), 40 barrels at \$8.50; Halderman & Co., 96 barrels at \$8.80; A. Buchanan, five barrels at \$9.20; Benedict, Waters & Co., 20 barrels at \$9.20; Willoughby & Morian (A. Willoughby, now of Bradford), nine barrels at \$9.20.

TITUSVILLE, Pa., Jan. 2, 1861.

Mr. Richmond, a commission merchant from New York, is here soliciting consignments. He offers a guarantee of 40@42 cents per gallon for all oil consigned to his house.

Cozzens & Co. had made frequent complaints of the loss of oil occasioned by leaky barrels. Knowing the barrels were in good order when shipped, I was at a loss to account for the leakage, but, visiting the Erie railroad yards at Jersey City soon after, I found that there were no unloading platforms and the barrels were thrown on the frozen ground and leaks followed as a matter of course. I called upon Mr. Blanchard, general freight agent, and asked him to furnish platforms to unload upon. He replied: "If you want platforms, build them yourself. We don't want to carry your oil, and wish we had never seen a barrel of the d—d stuff."

ERIE, Pa., Feb. 5, 1861.

Bought 70 barrels of benzine at 45 cents a barrel.

Benzine was used to lighten the oil made from coal, but the refiners found that the solution was only mechanical and a few explosions, though fortunately harmless, soon taught them that adulteration did not pay, and the price of benzine declined. My correspondent at Parkersburg reported that a big flowing well had been struck at Burning Springs, and I went immediately to Virginia. My diary reads:

BURNING SPRINGS, Va., Feb. 15, 1861.

There are five wells producing here now; one of them, called the Lewellyn well, is flowing 20 barrels per hour. This well has drawn together the most excited crowd of men I ever saw. Sales of neighboring lands are being made at extravagant prices. A single transaction amounted to \$100,000, another to \$80,000. A few leases have been made for single locations near the big well for \$1,000, spot cash, \$1,000 more when the well begins to produce, and one-third of the oil, delivered in iron-bound barrels.

This provision of the working interest delivering the oil in barrels without cost to the royalty was not so very bad with oil at \$5@10 a barrel; but when it went down to a low figure the whole produc-

tion would not, and did not, bring enough to buy barrels to hold the royalty alone. I think these terms were modified during the next summer. The Lewellyn well, I remember, was tubed with copper pipe.

As the Little Kanawha river furnished the only means of transportation to market, and was navigable only when there was a "fresh," the flowing well had to be shut in when the river was low. This was done by winding a rimmer with rags and attaching it to a long stick of heavy timber about six feet from the end. One end of the timber being securely fastened, the rimmer became a fulcrum pressed into the tubing by the weight of the long end of the timber acting as a lever. When the river was high the boats were moored to the bank near the well, the lever was raised, and the oil flowed through spouts directly to the boats, and was floated down to Parkersburg, where it was barreled and shipped to other points. This well did not "flow" in the sense that the word is understood now: it seemed to boil over and discharge a stream the full size of the tubing.

When watching the loading of the boats General Karnes remarked that as soon as he could raise the money he intended to lay cast-iron gas pipe from the Springs to Parkersburg and let the oil gravitate to the Ohio river.

PARKERSBURG, Va., April 2, 1861.

The river is in good navigable stage and oil is arriving in large quantities, exceeding the demand. Ten cents a gallon is bid.

I find an entry April 5, 1861, which indicates that the idea of a "shut in" was very old: The oil men say that the price (10 cents per gallon) is too low, and they are determined to produce only enough to pay their debts, then stop pumping.

During the remaining days of April and part of May the record contains little of interest except rumors of war, local riots and personal conflicts between union men and secessionists. The first epoch in the petroleum trade closed with the beginning of summer in the year 1861.

Natural Gas Lighting Itself.

A rush of natural gas at Grapeville, Friday night, was ignited in an unexpected and curious manner. Workmen were laying pipe from a well to connect with the Southwest Co.'s main. Before the connection was completed, however, the gas was turned on for some purpose. The frisky and capricious fuel, issuing from the uncompleted end of the line, struck the frozen ground with terrible force, plowing up the earth and pebbles in a lively way. Although there was no fire of any character in the vicinity in a few minutes the gas ignited like a flash, lighting up the country in a dazzling and uncanny manner to the utter amazement of the workmen who were some distance away. The only theory on which the firing of the gas can be accounted for is that two stones of a flinty character came in contact with each other producing a spark. A workman at the well saw the light and knowing that the gas had been ignited in some accidental manner turned it off as quickly as possible. This was an entirely new experience for the men at work on the line and awakened them to the additional perils of the subtle fuel.—*Westmoreland Democrat*.

RIMERSBURG, Clarion county, is being piped for natural gas, the recently completed well near there to furnish the supply.

THE EVEREST CASE.

THE MOTION FOR A NEW TRIAL DENIED BY JUDGE HAIGHT OF BUFFALO.

JUDGE HAIGHT, of the Supreme Court, Dec. 24, handed down a decision denying a motion of Hiram B. and Charles M. Everest, the Vacuum oil men, convicted of conspiracy, for a new trial. This is the famous case tried last spring in which certain Standard oil magnates were interested, several of them to the extent of being indicted with the Everests. Judge Haight, in the accompanying opinion, says:

The defendants were convicted of the crime of conspiracy to injure trade and commerce. Upon the trial and at the conclusion of the people's evidence, the defendants' counsel requested the court to advise an acquittal upon the grounds "that the evidence in the case is not sufficient to warrant the conviction of the offense alleged in the indictment; that the indictment charges one indivisible crime, consisting of many elements, which elements are unified in a paragraph in the pleadings inserted for that purpose; that the prosecution cannot succeed without proving all the elements which thus united make up the crime charged in the indictment." The motion was denied and an exception taken, for which it is now urged that a new trial should be granted.

The indictment charges that the defendants did wrongfully conspire with each other to obtain and do various different things, upwards of twenty in number, the last of which is "to commit acts injurious to public morals and to trade and commerce by all the means in their power or which they could devise, and in particular by the means and in the manner hereinbefore set forth." * * * And that all the matters and things hereinbefore set forth, being parts and matters and provisions of one agreement and conspiracy and for one end and purpose, as hereinbefore set forth." The indictment then proceeds to allege overt acts.

Upon the trial evidence was given tending to sustain some parts of the argument but not of the whole thereof as alleged. The question is thus presented as to whether the charge can be maintained without proving the whole of the agreement as alleged. The offense as charged took place under the Revised Statutes before the adoption of the Criminal Code. The indictment, however, was found after the adoption of the Code of Criminal Procedure, so that while the crime is to be determined under the statute, the practice and evidence are provided for by the code. The statute is that "in case two or more persons shall conspire to commit any act injurious to the public health or to public morals, or to trade and commerce, or for the perversion or obstruction of justice, or the due administration of the law, they shall be guilty of a misdemeanor." The gist of the crime is the unlawful agreement or conspiracy to do the act, and, in order to sustain a conviction, an agreement to do the act charged must be proved; but is it necessary to go beyond, and prove an agreement to do other acts and things simply because they are alleged in the indictment as part of the agreement? I am aware that at common law the courts adhered closely to the allegations in the indictment and that a variance in the proof, in many instances was held fatal; and that there is authority in England tending to sustain the defendant's position; but I am not satisfied that such a rule exists in this country under the Code. Section 44 of the Criminal Code of Procedure provides that "upon an indictment for a crime consisting of different degrees the jury may find the defendant not guilty of the degree charged in the indictment and guilty of any degree inferior thereto, or of an attempt to commit the crime." Section 45 provides that "In all other cases the defendant may be found guilty of any crime, the commission of which is necessarily included in that with which he is charged in the indictment." The crime of conspiracy does not consist of different degrees, and is consequently brought within the latter section, under which they may be convicted of any charge necessarily included in the charge. If, therefore, sufficient of the agreement is proven to establish a conspiracy to injure trade and commerce, and the matter so proven is included in that which is charged in the indictment, it appears to me to be sufficient. This view is not new, nor is it confined to the Code. Bishop in his work on Criminal Procedure, Vol. 2, Section 712, states that "if there is less proved than charged, there may be a verdict and judgment sustaining so much of the allegation as the proof covers." So that in case a person is charged with the larceny of a horse, wagon and harness, if the evidence established a larceny of the horse and wagon a conviction may still be had, even though no evidence was offered tending to show a larceny of the harness.

At the conclusion of the trial the defendants requested the court to charge that the alleged enticement of Miller was not an overt act upon which conviction could be had, because nothing in relation to that act was done in the county of Erie, which was refused and exception taken.

Miller was in the service of the Buffalo company, in the county of Erie. The evidence does not clearly disclose at what particular place he was induced to leave the employment of the Buffalo company. Some of the conversations appear to have taken place in the city of Rochester, others in the city of New York, and the agreement on the part of the defendants to hire him for the Vacuum company was finally consummated in the city of Boston. It would appear, however, that he had made up his mind to leave the Buffalo company while in the city of New York, before going to Boston, from the fact that he under the advice of Hiram B. Everest telegraphed his wife, then in the city of Buffalo, to remove with her household goods to the city of Rochester. Wherever the agreement was finally consummated, the fact exists that he was enticed from his employment in Buffalo, and the effects of the act, if any, were upon the business, trade and commerce of Erie county, and it appears to me the misdemeanor is thus brought within the provisions of section 134 of the Code of Criminal Procedure, which provides that "when a crime is committed partly in one county and partly in another, or the acts or effects thereof constituting or requisite to the consummation of the offense occur in two or more counties, the jurisdiction is in either county."

The court was also requested to charge that a conspiracy merely to injure a private person by an act not criminal in itself does not come within the statute forbidding a conspiracy to injure trade and commerce, which was refused and exception taken.

At the time the request was refused the word "merely" appearing in the request did not attract my attention as having the force or effect that it now appears to have. It appears from the reviser's notes that when the statute was reported to the Legislature, it contained the clause "to defraud or injure any person in his trade or business," and that this clause was stricken out by the Legislature. I shall not, therefore, attempt to question the correctness of the request, but I am not satisfied that the refusal to charge the request renders a new trial necessary. It is well settled that the trial court cannot be called upon to repeat charges already made, or to charge merely abstract propositions not embraced in the case under consideration. The request is understood to pertain to the charge of enticing Miller from the employment of the Buffalo company. The enticing away of a servant of another is not a lawful act, neither is it a criminal act; but the court in its charge had not submitted any question to the jury to the effect that there could be a conviction for the enticing away of the servant upon the theory of its being an injury to a private person. On the other hand, the jury were distinctly told that there could be no conviction for the enticing away of Miller unless such enticement had the effect to injure trade and commerce, and that such injury must be a public injury.

The Court in its charge says: "In reference to the enticing away of a servant by one individual from the service of another it is not of itself criminal; but you have no right to go to your neighbors and entice away your neighbor's servant from his employment; and in case you do so, you become liable for damages such as he can prove that he has sustained by reason of your unlawful enticing away of his servant; still you would not be guilty of a crime. But if in the enticing away of the servant the effect is to injure trade and commerce, then, gentlemen, it may become an offense within the provisions of the statute, provided there is a conspiracy, and the enticing away was done in accordance with and in the furtherance of this conspiracy." It will thus be observed that the jury was distinctly informed that it would not be criminal to entice away a servant unless it had the effect to injure trade and commerce. The request was consequently in substance a repetition of the charge already made, and it was not error to refuse to repeat it.

The three questions considered were the only ones discussed upon the motion, and are consequently the only questions which I at this time feel called upon to consider.

The motion for a new trial should be denied.

THE Chambers-McKee Glass company, capital \$250,000, has been incorporated and will proceed at once to the erection of large works at Grapeville, Westmoreland county. The object is to be near the gas supply. James A. Chambers and H. Sellers McKee, of the Chartiers Natural Gas Co., of Pittsburg, are the principal stockholders.

HOW REFINING IS DONE.

DESCRIPTION OF THE PROCESSES AND ADJUNCTS OF AN OIL REFINERY.

THE Oil City *Blizzard* representative is indebted to Mr. A. D. Deming of the Independent Refining Company, for points in preparing the following description of the *modus operandi* of refining: When the crude oil is received at the refinery it is put in storage tanks and run from these tanks to the stills, as it is needed. Stills are large iron tanks with an oval top, the capacity ranging from 250 to 1,000 barrels. There are two distinct variety of stills, viz: the "cheese box" still and the "boiler" still. The first is called the cheese box still on account of the great resemblance between it and a cheese box. The boiler still is very much like a huge boiler, and it is from this resemblance it derives its name.

The still is set on solid masonry, a considerable distance above the ground. This masonry is lined with fire brick, so as to stand the intense heat to which it is subjected. The object in raising the still is to get it above the reach of the flame from the furnace which, if it should touch the bottom of the still, which would scorch and discolor the oil.

From the top of the still extend pipes that carry the vapor arising from the heated oil to the "condenser." Condensers usually consist of a strong wooden box, about eight feet square and from fifty to seventy-five feet long. They are elevated a considerable distance from the ground and filled with water, which is kept at as low temperature as possible by being constantly changed. This water is supplied at one end of the condenser and discharged at the other, so as to maintain an even temperature the entire length. As the vapor comes from the still it passes through iron pipes that run the entire length of the condenser, returning back and forth several times and is thus condensed from a vaporous to a liquid state. It is then discharged at the opposite end by a single pipe into a "manifold" and is then known by the general term of "distillate."

A "manifold" consists of a large horizontal pipe about five feet long with a receiving box, which has glass sides so that the flow of the distillate can be seen, on top. To the lower side of the manifold are connected as many lead pipes as there are different grades of oil products. Each pipe leads off to a tank designated for the storage of a certain product. Benzine, being the lightest and most volatile product, is the first to be driven off in the still, and after passing through the condenser it comes to the manifold. The stillman in charge now opens the stop-cock in the pipe leading to the benzine tank, keeping all the others closed till the benzine has been discharged. This pipe is then closed and the one leading to the light oil tank is opened. This separation is called "cutting" and applies to all grades. After the light oil has all been driven off comes the "water white," which is the most valuable product produced from petroleum; after this comes the heavier grade, which is slightly colored from excessive heating; a certain quantity of this grade and the light oil are mixed together; the result of the combination is the common lamp oil or "standard white," which is so generally used.

In making the cuts the stillman is largely governed by the specific gravity and the color of the product. Finally

the distillate comes out too heavy to make good illuminating oil. Then it is known by the name of "slops." These slops are run again with crude oil, so as to get all the good oil out of them. They are not allowed to pass through the condenser, but by letting the vapor pass out through the manhole in the top of the still, it is reduced to the consistency of tar, and is known as "residuum."

From the best crude oil, such as is produced in the middle and lower oil districts, and known as "premium oil," the following yield is produced:

20 per cent. benzine, gravity, 70 deg.
30 per cent. water white, fire test 150 deg.
38 per cent. standard white, fire test 115 deg.
6 per cent. residuum, gravity 20 deg.
6 per cent. loss, caused by evaporation and coke in the still.

Standard white distillate is generally put through a steam still where enough of the light or explosive qualities are driven off to make it stand the requirement of the law in the State in which it is to be sold. After passing through the steam still it is pumped into a large lead-lined tank with a pointed or convex bottom, called an "agitator." Here it is mixed with a certain amount of sulphuric acid and the whole violently agitated by means of an air pump or blower for nearly an hour. After settling thoroughly the spent acid is drawn off at the bottom. The object of the acid is to whiten and disenfect the oil, and the extent of its work may be seen in the black, tarry-looking precipitate which is drawn off. Now as acid does not burn well the next step is to eliminate all traces of the acid from oil, which is accomplished by a spray of cold water, falling from above; water being heavier than oil, readily sinks to the bottom, taking all impurities with it. But to eliminate all traces of the acid a certain quantity of caustic soda is mixed in, which has a neutralizing effect. This soda is then washed out and the oil pumped into "bleachers" or settling tanks, and in a few hours may be considered finished and ready for market.

Benzine may also go through the steam still process to separate the light from the heavy grades, and then be treated with acid and soda similar to oil. The products thus obtained are known as gasoline and naphtha. The former is largely used in the west as fuel for cooking purposes and the latter for mixing paints instead of turpentine.

It requires about three days to run off a 500-barrel still, and from one to two days' time in the steam still and one day to settle, making ordinarily about seven days' time to complete the process of refining crude petroleum, though the time varies with different grades of crude.

Oil barrels are made of best seasoned oak, bound with iron hoops, well driven on. The inside is treated to a heavy coat of hot glue, which so completely fills the pores of the wood as to prevent leakage.

The hoops of a domestic oil barrel weigh ten pounds, while those on barrels used for exporting weigh twelve pounds. Six and one-half pounds of oil, or five and one-half pounds of gasoline is called a gallon. A large share of the cost of building a refinery is in the pipes and their connections, although the various pumps required to handle the different products separately, and the storage tanks, are items of much importance when considering the expenditures.

SOME excitement has been created in the vicinity of Charlotte Center, Chautauqua county, N. Y., by a small showing of oil and gas in a well drilled there.

OPERATIONS IN DECEMBER.

Wells Completed, Wells Drilling
and Rigs Up and Building
in the Entire Region.WELLS COMPLETED IN DECEMBER
1887.

Allegheny Field.

Twp.	Owner.	Barrels.
Scio, lot 46, L G Norton No 4.		5
Clarksville, H A Phillips.		8

Wells completed.	2
Production.	13
Dry.	

Bradford Field.

West Branch, Mack, F M Leasure & Co.	dry
Sugar Run, lot 3706, H Porter & Co.	dry
Knapps Creek, Erskine, Doe & Smith No 1.	3

Wells completed.	3
Production.	3
Dry.	2

Middle Field.

Farm.	Operator.	Barrels.
GRAND VALLEY.		
Wales, John Wales.		5

VICINITY PLEASANTVILLE.

Landis, W P Black	dry
Weekley, R Foggins	6
Atkinson, Waite & Hamlin No 4.	2
Lyle, Ed Gray No 2.	7

HARMONY TWP, FOREST COUNTY.

Kepler, Beaver & Hale, Carnahan Bros No 3	10
Neiltown, Black Bros.	dry
Copeland, Proper & Co No 1.	10

MISCELLANEOUS.

2020, Andrews & Barnsdall No 5.	20
2033, Highland Oil Co No 7.	10
" No 9.	10
" No 10.	10
2676, Wilcox Oil Co No 5.	15

Wells completed.	13
Production.	105
Dry.	2

Venango.

Longwell, Longwell & Co, N 2.	dry
Ross, B. F. Brundred, No. 7.	2
Niagara, Henry Wilbert.	dry
Anderson, Trax & Simmons, No. 3.	2
Blood, W H Wallace.	5
Cherry Tree, H Goehring & Co.	dry
Purtell, James Purtell.	dry
Church Run, Dr J L Dunn.	dry
Mead, J B Smithman, No 6.	5
Archer, Taylor & Co.	dry
Loyd, Munson & Co.	2

RED VALLEY.

Campbell, Shoup & Co.	5
Dale, A P Dale, No 1.	dry

SLAB FURNACE.

Wickersham, Guckert & Co, No 3.	6
J K Dale, Shafer & Dale, No 3.	12
Davis, Mays & Co.	4
Keystone, Hart Bell.	3
Keystone lands, Duffield & Co No 2.	5
" No 3.	3
Phil. & Bost, Kelley, Smullin & Co, No 7.	8
" No 8.	10
McCalmont, May Bros & Church.	4
Mays, Moriarity & Co, No 2.	7

HALL'S RUN.

Schoolhouse lot, Dodd & Richie.	7
Rote, Ritts and Heeter.	6
Hazlett, J M Detrich & Co.	3
Wilhelm, Wurster & Rumbold, No 1.	4
McCalmont, Koch & Co No 2.	5

MT. HOPE.

Sheppard & Galbraith, Sheppard & Galbraith No 9.	15
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HUGHES RUN.

Phil. & Bost, Davis & Co. (wildcat).	dry
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PLUMER.

Bromley, Bromley & Co No 1.	3
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SIX POINTS.

Markel, J. P. Crawford & Co.	2
Darnell, Wilson Bros. & Co.	3
W P Grant, Simpson & Co.	5

VICINITY EMLENTON.

Sternburg, Porterfield & McCombs.	6
Wells completed.	35
Production.	142
Dry.	8

Clarion.

Farm.	Owner.	Production.
Kahle, McCleery & Co.		2
Buzza, Heeter & Co.		1
Wells completed.		2
Production.		3
Dry.		0

Butler and Armstrong.

Chas Duffey, Hoch & Co.	35
Gumper, Brady & Co.	35
A A Black, Seybert Bros No 2.	25
Jas Bromfield, M P Black & Co.	25

BRUSH RUN.

Warren, Munhall & Co No 2.	dry
J S Marshall, Chartiers Oil Co est.	dry

THORN CREEK.

Bulford, A K Klingensmith	15
Dixon, Dr Reynolds.	dry
Burton, Greenlee & Russell.	15

SAXONBURG.

Lonitz, Bolard, Greenlee & Co No 3. est.	112
P Ohle, " No 6.	dry
Battenfelder, Bolard, Greenlee & Co No 2.	dry
Seibert, " 1, est.	10
Adler, Urquhart, Lavens & Co No 2.	dry
Englehart, Urquhart, Lavens & Co No 1.	dry
Foercht, Haymaker & Co No 2. est.	30
Foercht, Urquhart, Lavens & Co, No 1.	15
Adler, Troutman Oil Co No 3. est.	5
Pfabe heirs, Reiber, Yeakel & Co No 1.	10
Battenfelder, " 2, est.	5
" " 3.	dry

Aderhold, Golden, Wuller & McBride No 2.	125
H Lonitz, Golden, Wuller & McBride No 2.	dry
Frazier, Black & Co.	dry
Battenfelder, T C Fall & Co No 1, est.	5
Shields, Winkle Oil Co.	dry
Muder, Loan, Baker & Co, est.	50
Battenfelder, Extension Oil Co No 4.	50
" " 6.	120
" " 8.	96
" " 9.	20
" " 10.	18
" " 11.	20

Severance, Hayes & Alexander No 1.	dry
Seibert, John A Snee & Co No 2, est.	5
" " 3.	5
" " 4.	15
Beauman Heirs, Iman & Co No 3.	8
Grabbe, R R Armor & Co No 1.	dry
Severance, Marshall Oil Co No 1.	dry
" No 2.	dry

Wells completed.	41
Production.	874
Dry.	15

Washington.

Munce, Johu McKown No 17.	50
Boland, H O Robbins	dry
Carson, Roth, Peiffer & Dyer.	3

Wells.	3
Production.	53
Dry.	1

DRILLING WELLS RIGS UP AND
BUILDING DEC. 31, 1887.

Allegheny Field.

Lot.	Owner.	Depth.
Scio lot 46, L G Norton.		drilling
Alma lot 4, Breckinridge & Co (shut-down)		2 1200
Wirt lot 47, C H Tew.		drilling
Clarksville lot 10, Steele & Fields.		rig
" 12, M M Congdon.		rig

Rigs up and building.	2
Wells drilling.	2
Total.	4

Bradford Field.

Quintuple, Thomas Hanley.	1500
Foster Brook, E T Co, Kerwin & Co No 12.	700
Indian Creek, Ramsey & Co.	rig
Warrant 3085, Newell & Co No 1.	1400
Mount Jewett, Knox Bros & Co.	drilling
Hamlin twp, Van Scoy & Co (shut down).	1100

Rigs.	1
Wells drilling.	4
Total.	5

Middle Field.

KINZUA VILLAGE.

Harris, Fogle.	rig
CLARENDON.	
Lot 562, Goal Bros No 6 (fishing).	drilling
532, C A & D Cornen No 5 (shut down).	900

COOPER DISTRICT.

Reno, Capt Haight.....drilling

WARREN.

Sill, John Truby.....drilling
Asylum lot, Jamieson.....rig

HARMONY TOWNSHIP, FOREST COUNTY.

Connelly, W P Black No 2.....drilling
Kepler, Beaver & Hale, Fogle & Co No 1, drill'g
Dossin, Wolcott & Co No 1.....drilling
Joslin, Wood & Co No 3.....rig
Neil, Lord & Henne No 1.....rig

MISCELLANEOUS, ELK COUNTY, ETC.

2032, Boggs, Rosenberg & Co No 4.....800
3663, Elk Oil Co No 4 (shut down).....2300
2033, Highland Oil Co No 8.....1800
2033, " 11.....1200
2030, Barnsdall & McDermott.....1800
1464, Barnsdall & Co (shut down).....rig bldg
3212, Armstrong & Co No 1 (shut down).....sand
3212, " 2.....1200
5508, (Forest) Shannon Syndicate (shut down).....1675

New rigs.....4

Wells drilling.....11

Total.....15

Venango.

Rynd, Carnahan & Myers.....drilling
McClocin, — McClocin No 3.....drilling
Longwell, Longwell & Co No 3.....rig
Turner & Franchin, Lufkins & Myers, drilling
Raymilton Krepp, J. Patterson (wildcat) No 1.....600

VICINITY PLEASANTVILLE.

Lyle, Gray & Fullerton.....drilling
Lyle, Alex Lowry.....drilling
West Pithole, J. H. Windsor.....drilling
Weekley, B Foggins No 11.....drilling
Vose, M N Miles No 2.....drilling
Clark, Corwin & Co.....drilling
Madison, Dodge & Refinburg.....drilling
Noyse, Hass Noyse.....rig
Newton, Zittle & Son.....drilling

PITHOLE AND PLUMER.

Duke, W P Black, wildcat.....drilling
Ogley, B Brundred No 1.....drilling
" W J Innis No 2.....rig
Bromley, Bromley & Co No 2.....drilling

SLAB FURNACE, ETC.

S P McCalmont, Koch Bros No 2.....drilling
Phila & Bost, Kelley & Smullin No 9.....drilling
Keystone, Guckert & Co No 1.....rig
Dr Carey, Dodd & Ritchey No 1.....rig
Wicks, Judd & Geiser No 1.....drilling

HALL'S RUN.

Zeigler, Wolf & Shafer.....drilling
Boyle, Deitrick & Co No 1.....drilling

MT. HOPE.

P Stroup, Sheasley & Galbraith No 2.....drilling

BULLION.

Balliett, W T Baum.....drilling

SIX POINTS.

R. S. Grant, David Allen.....900
R S Grant, Gosser & Co.....800

VICINITY EMLENTON.

Jones, W Stevenson, Squaw Valley.....drilling
Fox, Morgan, Fox & Co.....rig bldg

New rigs.....6

Drilling.....25

Total.....31

Clarion.

Fillman, J. R. Fillman.....drilling
Whittaker, Berlin & Son No 2.....rig
Normal School lot, Normal School.....drilling

New Rigs.....1

Drilling.....2

Total.....3

Butler and Armstrong.

Blakeley, Coast & Co No 4.....1000
Galebaugh, Leidecker Bros No 2.....1000
Miller, Schlegel.....drilling
Snow, Gantz & Co.....750
Wm Goering, W L Guckert & White.....300
Jos Critchlow, J Critchlow.....900
Galebaugh, Connors, Fishel & J P Bredin, sand
Doering, M P Black.....rig
Hilderbrand, Neff.....rig
Lloyd, Stage & Co (shut down).....sand
Thorn Creek, Bufford, Hattery & Co.....1550
Dodd (Buffalo Creek, Reep & Sutton (wildcat) rig
James Bromfield, Campbell & Murphy.....1500
William Bromfield, Davis Bros.....drilling
Robert Morrow, Morrow.....drilling
Gumper, Brady & Co.....rig bldg
Downy, Steinbrook & Co.....rig bldg
Downy, McElhany.....rig bldg
Chas Duffey, Owen Brady.....1500

BRUSH CREEK.

Dutell, Burchfield & Co	1200
Sam Marshall, Munhall & Co	800
Mashy, J G Jennings	400
Reynolds, McKelvey & Co	drilling

SAXONBURG.

Beauman heirs, Bolard, Greenlee & Co No 2 (shut down)	400
J H Lonitz, Bolard, Greenlee & Co No 1	1000
P Ohle, Bolard, Greenlee & Co No 1 (shut-down)	300
P Ohle, Bolard, Greenlee & Co No 2 (shut-down)	rig
P Ohle, Bolard, Greenlee & Co No 3 (shut-down)	rig
P Ohle, Bolard, Greenlee & Co No 4 (shut-down)	rig
P Ohle, Bolard, Greenlee & Co No 5 (shut-down)	rig
Battenfelder, Bolard, Greenlee & Co No 3 (shut-down)	rig
Adler, Bolard, Greenlee & Co No 2	500
Urquhart, Lavens & Co No 3	rig
Troutman Oil Co No 4	rig bldg
Battenfelder, Extension Oil Co	800
"	rig
"	rig bldg
Seibert, John A Snee & Co No 5	300
Crawford, Haymaker & Co No 1	550
"	sand
Welch, R R Armor & Co No 1	rig
Battenfelder, Reiber, Yeakel & Co No 1 (old)	rig
Reudert	1
Aderhold, Golden, Wuller & McBride No 3	rig
H Lonitz	3
Frazier, Marshall Oil Co No 1 (shut-down)	1500
Graham, Calhoun & Co No 1	rig
Crawford, Gillespie No 1	rig
Reudert, Staley & Co No 1	1100
Helmbold, B B Campbell No 1	rig
Muder, Loan & Co No 2	sand
Welch, Root Bros No 1 (shut-down)	1300
Smalley, B B Campbell No 1	drilling
Battenfelder	2
Seibert, Gibson & Gahagen	1300
Gallagher, Burchfield	800
Logan, Fishel & Co	drilling
Mrs. Rudert, Davis, Starr & Co	drilling

New rigs	16
Drilling	30

Total..... 46

Washington.

McKeesport, Stone & Co (old)	1800
Bane, Ten-Mile Oil Co (shut-down)	1039
Bailey, McKenna Oil Co (fishing)	1800
Cameron, Willets & Young (fishing)	1740
Miller, Marshall Oil Co No 2 (fishing)	1900
S Fergus, S Fergus	1300
McBurney, Wheeling Oil Co	1000

CANNONSBURG.

W Pollock, Scott & Co	sand
J Buehannan, Fisher Oil Co (shut-down)	sand
McNamara, McKeown & Scott	rig
McLaughlin	rig

TAYLORSTOWN.

Hutchison, Washington Oil Co	500
Vincent Blayney, Washington Oil Co	1400
J M McMannis	No 2
(shut-down)	sand
Neeley, Washington Oil Co No 1 (shut-down)	2508
Sam Wright, Washington Oil Co	700
Hilton, Ellsworth & Preston	800
"	rig
Martin, Washington Oil Co	rig
Robert Crothers, Caldwell Oil Co	rig
Jas Hodgins, Washington Oil Co No 2	rig
McCabe, R H Thayer	rig
Crawford, Palen & Co	rig

New rigs	8
Drilling	10

Total..... 18

Shannopin, Etc.

Oakdale, A F Allen Brown & Co	1000
D P Collins, A F Allen Brown & Tomlinson	rig

GREENE COUNTY.

Girard, Willow Tree, E M Hukill No 3	700
Hathway, Davistown	1
Evans, Mount Morris	1
Fordyce	1
Nineveh, Johnson & Hamilton	2200
D L Donley, Alexander & Co	drilling
D L Donley, E M Hukill	rig bldg

New rigs	3
Drilling	6

Total..... 9

OPERATIONS FOR GAS.

Wells Finished in December, 1887.

ALLEGANY FIELD.

Wirt lot 44, Allegany Gas Co (for gas)	gas
" 39, Empire Gas Co (for gas)	gas
Wirt, lot 64, Cuba Gas Co (for gas)	gas
64	gas
Clarksville lot 3, M J Jordan (for gas)	gas

BRADFORD FIELD.

Eldred, Mulraney, Eldred Board of Trade (for gas)	dry
Winfield G Ellis, Eldred Gas Co (for gas) No 2	dry

Middle Field.

CLARENDON.

Farm, Operator	
Lot 51, Citizens' Gas Co (for gas)	gas
51, A O Donald (for gas)	gas

MISCELLANEOUS.

Lot 5208 Warren county, C K Book & Co	gas
2684 McKean, National Transit Co No 32	gas

Wells completed..... 11

WELLS DRILLING AND RIGS UP AND BUILDING FOR GAS.

Allegany Field.

Wirt, Lot 1, Empire Gas Co	drilling
" 1	rig
" 58, Cuba Gas Co	drilling
Clarksville, Lot 2, National Transit Co	drilling

Bradford Field.

Mack, Manufacturers' Gas Co, (shut down)	750
--	-----

Middle Field.

WARREN COUNTY.

Lot 212, Pennsylvania Gas Co, No 19	sand
" 253	No 20
"	rig

Lower Country.

VENANGO COUNTY.

Emlenton, Emlenton Citizens' Gas Co	sand
BUTLER AND ARMSTRONG.	

Craigtown, J M Guffey	sand
Martinsburg, W J McKee	drilling

WASHINGTON.

Vanceville, Willets & Son	drilling
Kammerer	drilling
Brownsville, Home Nat Gas Co, No 3	1600

Rigs	2
Drilling	11

Total..... 13

Testing Natural Gas Burners.

The Philadelphia Company is conducting a series of experiments for its own benefit and that of the many who use natural gas as an illuminant, especially in mills and workshops. On the second floor of the Penn avenue office are ranged about a dozen burners, each of different design and shape, and invented by several persons, who think they have made the perfect gas burner.

W. S. Stevenson has charge of the test. He explained that each burner was tested with a meter to see how much gas it consumed while giving its best light, and then all are connected with one pipe and shown to mill owners and others interested. The burner now commonly used is an open pipe with a tin can over it, not designed to give much light, though it does burn much gas. This the company is determined to stop, and burners that consume 120 cubic feet per hour do not give one-tenth as much light as those, properly designed, that consume only 40 or 50 cubic feet per hour.—*Pittsburg Dispatch*.

A COMPANY has been organized to pipe the gas from the Epler well on Fifteen to Marietta. Philadelphia capitalists are prominent in the organization. The Epler well is "one of the largest," having an open pressure of 750 pounds, it is said.

Locomotives to be Run by Gas.

Within the past nine months more improvements have been made in railroad equipment than in any like period in the history of the country. Perhaps the most daring one now being attempted is the utilizing of natural gas as fuel for engines and to furnish light and heat for the cars. Several master mechanics in the country hold that this product can be confined and used at will, and the master mechanic of the Fort Wayne, Cincinnati & Louisville road has demonstrated his belief so plainly that the officials of that line have placed at his command all the money, men and material necessary to a thorough test. The route of that road is through the heart of the immense gas regions of Indiana, many of the wells being of great pressure, and flowing from 3,000,000 to 12,000,000 cubic feet every twenty-four hours.

Several weeks ago the master mechanic and superintendent had constructed a wrought-iron cylinder, eighteen feet long and two feet in diameter, with heavy ends screwed in. The cylinder was subjected to the most critical and scientific tests, and was provided with gauges to register the pressure. It was placed on board a car and transported to Montpelier, Ind., where there are located two strong gas wells. The cylinder was attached to one of them, which had a rock pressure of 450 pounds to the square inch. When the gas was turned on the gauge showed that it was full in less than one minute. The tank was then loaded on the cars and taken to the shops at Fort Wayne. Here it was attached to the usual natural gas burning apparatus with a "regulator" that controlled the enormous pressure of the gas so that it flowed out in a steady regular current of one and a half ounces to the square inch, the pressure at which natural gas is burned. The gauge showed that the gas had lost but little of its pressure, and it supplied light in the burners in the shops for several hours, besides heating one large stove and one forge.

So much of a success was the first test that others have been made with larger cylinders and the gas transported each time a distance of thirty-eight miles. The officials and experts are so well satisfied with the experiment that orders have been issued to equip the road engines with tanks, and the workmen in the shops are now making the necessary changes. Large steel tanks or cylinders somewhat after the pattern of the Standard Oil Company's cars are being made, and these will be attached to the engine in the rear of the tender. They will have a capacity equal to as many thousand cubic feet of gas as will represent enough of coal to make a trip over the road, which is about 110 miles in length. The attachment to the fire box of the engine and stoves in the cars will be by means of a pipe leading from the tank, and will be regulated by a hand screw.

The cost is exceedingly small, as an engine can be supplied for about twenty cents a day.

The experiments made at Fort Wayne have been watched by expert mechanics employed by the Erie and the Pennsylvania companies, and these systems will also commence the construction of gas tanks for the same purpose. In case the tests made by these companies are successful, it will be only a short time until the full problem on railways is solved.—*Kansas City Times*.

FRIENDLY RIVALRY.

THE BIG EXCHANGES ON GOOD TERMS, BUT COMPETITION SHARP AT TIMES.

THE *Oil, Paint and Drug Reporter* has the following: The rivalry, and the feeling of antagonism on the part of the older exchange, which exists between the Consolidated Stock and Petroleum Exchange and the New York Stock Exchange has been the cause of much talk among the members of both. The following moves have been attributed to the Stock Exchange people as aimed at their younger rival, with a view to cripple its business facilities and force it out of competition: First, a resolution to prevent all direct telephonic and telegraphic connection between the two exchanges; second, a movement to reduce commissions, third, an effort to list oil; fourth, a resolution to prevent the occupancy by its members of offices in the new exchange building; and fifth, a movement to secure the discharge of all clerks employed by the membership, and who, being members of the new Exchange, shall refuse upon demand to sever their connection with that body. To get a clear expression from prominent members of both exchanges a reporter sought interviews with several on each exchange, from which we select the following as being representative:

Mr. Charles G. Wilson, president of the Consolidated Stock and Petroleum Exchange, said: "Reports of antagonistic action on the part of the Stock Exchange Governors in opposition to this Exchange from time to time reach me, which, however, for the most part I regard as foundationless, although there have been certain unfriendly resolutions passed by that body which are absolutely authenticated; for example, the one embodying an effort to prevent direct telephonic and telegraphic communication between our new building and the old board. What their success will be in this movement is plainly foreshadowed in the present condition of the suit brought by our Exchange against the Commercial Telegraph Company, James D. Smith, president, and others, to restrain that company from the removal of its instruments from the floor of this Exchange. The point of law advanced by us was sustained, and is now enforced by a standing injunction issued by the Supreme Court of this State, with an accompanying opinion by Judge Dykman, which terminates with the following sentences, suggestive of the strength of our case:

"The nature and character of the business transacted at the Stock Exchange affects it with a public interest. It is of great concern to the public, and so becomes invested with interest thereto, and it seems to be within the constitutional authority of the courts of equity, in the silence of legislative enactment, to compel and enforce the publicity of the quotations in subordination to the interests of the public."

"These views lead to a continuance of the injunction, and the order for that purpose is therefore granted."

"I desire, however, to be distinctly quoted as entertaining no antagonism to the old board. We will soon take possession of our new building, which move will unquestionably advance our status to a higher point of market dignity than attained by us in our present quarters. We feel no antagonism, even as we fear none. Our business is developing phe-

nomenally, and we are happy in the present and confident of the future. As to the mooted listing of oil on the Stock Exchange, we have nothing to say in opposition, feeling perfectly confident of our ability to hold the business free from successful interference. As to the report of an effort now being made by us, through motives of revenge against the Stock Exchange, to influence legislation in behalf of a bill for stock dealing taxation, I can only repudiate it in toto. We regret any feeling of opposition which may exist in the old board and directed against us, and feel that it is the wiser course to dismiss every sentiment of an antagonistic nature and cultivate friendly relations looking to the exercise of united effort for the conservation of mutual interests."

Mr. H. K. Enos, of the Stock Exchange, and a member of the Governing committee, said: "The reports of any special animus or effort on the part of our Exchange against the business and interests of the other organization in question are exaggerated and untrue. All the measures we have taken were such as are legitimate to a condition of rivalry, although the Consolidated Stock and Petroleum Exchange cannot be accurately classed as occupying that position to our association, as the dealings on that Exchange in the stocks listed on our board are comparatively trifling when considered as an element of opposition worthy of the name. The class of patronage is entirely different, and should the new board suspend its transactions, it is not probable that five per cent. of its customers would transfer their custom to us. As to the listing of oil upon our Exchange, I can only say that, in my opinion, the movement now being made in that direction is in no sense born of antagonism to the new Exchange, but is simply the outgrowth of a feeling that, as many members of the Stock Exchange are dealers in oil, the ability to trade in it on this floor would bring an acquisition of commission profit to the Exchange and convenience to its members. If such an effort be successfully consummated, it will be on a basis of individual connection with the primary oil markets. No trading will be done on borrowed quotations. If the registry of the certificates cannot be accomplished in accordance with the rules of our Exchange, we can place them in the unlisted department and trade without difficulty. If oil is listed on this Exchange, we will establish connections with all the great oil-producing centers, create a market absolute and unhampered, and it will simply become a question in the mind of the outside trader which of the two associations offering similar facilities it is his best policy to patronize, the Stock Exchange, with its established responsibility, or the Consolidated Stock and Petroleum Exchange, its young neighbor. I do not know of any feeling common to the old and against the new Board that can justly be designated as antagonistic, which word implies the presence of animosity, unknown, I believe, to the situation in point."

A well-known member of the Consolidated Stock and Petroleum Exchange, whose name is withheld by request, said: "Whatever antagonism has developed between the two Exchanges in question is official in its character, as, personally, the relations existing between the two memberships are cordial in the extreme.

In our Exchange we have the younger members of families which are represented on the old board, and community of dealing between the two Exchanges, transacted through the individual membership of each, is the rule and not the exception in this market. As to the proposition to list oil certificates on the Stock Exchange, I can only say that its successful consummation is an utter impossibility. Our oil business is a professional one, requiring special education and official connections to make it work properly. With the Oil Exchanges of Bradford, Pittsburg and Oil City we form a link in the chain of speculation which, under the existing laws of the Stock Exchange, could not embrace that organization. Representatives of these out of town Exchanges in interest require the presence of a representative on the floor of the New York Exchange. Should the Stock Exchange become a member of the league, an outlay of about \$20,000 would be required to secure a representation on that floor. If attempted by the Stock Exchange, the venture will inevitably prove a dismal failure, even worse than their effort to deal in mining stocks, which flourished for a few days, only to almost entirely die out. A reduction of commissions to our figure will not give them any advantage, but will rather increase than otherwise the strength of our position, as it gives us two markets in which to operate in behalf of our patrons—our own and the old Board—whereas their laws prohibit dealing on our Board, and consequently they would be curtailed in scope of operation to their own Exchange. I believe in the future the best elements of both Exchanges will unite to form one central New York market for speculative dealing in stocks. It is impossible for two parallel markets to work side by side with entire satisfaction to either party in opposition. This consolidation will be the inevitable result, but only as the work of time. As it now stands our Exchange is prospering, and our position is one which leads us to disregard the threatened opposition as powerless to affect us injuriously.

REVIEW OF A YEAR.

LEADING FEATURES OF THE PETROLEUM INDUSTRY DURING 1887.

PERHAPS the history of no other industry in the world is so full of startling changes and interesting situations as that of the production of rock oil. Every year brings forth its incidents of great moment. The year 1887 was no exception to the rule. While it produced fewer new fields than several preceding years, there were other movements of more moment than the mere rise and decline of a white sand gusher pool.

The year came in with the crude market depressed and the producing interest groaning under numerous burdens. The movement to reduce storage and pipeage charges and correct other evils of the pipe line system by legislation at Harrisburg buoyed the market up temporarily, and the reduction of storage charges caused a little speculative advance; but the failure of the proposed legislation caused a despondent feeling that with the development of the Riebold pool carried prices down to a very low level, and the average price for the year, for both crude and refined, is the lowest in the history of the business.

The causes leading to the unprecedented depression, however, led to other important results. The producers of the New York and Pennsylvania fields formed a protective alliance and set about the work of improving the condition of the business with commendable vigor. The Standard Oil Trust, which is practically the whole refining and transporting interest, profiting by knowledge gained during the agitation of the Billingsley pipe line bill, before referred to, made overtures to the producers, which, being met in a candid spirit, led to the mutual agreement by which the Producers Protective Association shuts in a portion of its production and drills no new wells until the 1st of November, 1888, and the Standard people hold a fund of oil for the benefit of the association and its employees.

This movement is an instance of the mutual co-operation of all the branches of an industry, labor, producing capital, transporting capital, manufacturing capital and marketing capital such as was never before seen, and its influence on this important industry must be as great as anything in the history of its development. It has reduced the production of petroleum to about one-half the consumptive demand and already effected a decrease of the surplus stocks to the extent of over 3,000,000 barrels.

The Washington oil field reached its highest production in 1886, but was still an important factor in the situation during the opening months of 1887, especially as the Taylorstown annex was in a very uncertain stage of development at that time. The Washington section was given an undue amount of attention because of the slow development of the deep territory. As Washington began to lose its force with the speculative fraternity the Riebold pool grew greater, and from the development begun in 1886, which attracted no great attention, it grew to be the absorbing topic of conversation of oil men everywhere.

Late in the year the Saxonburg pool was developed and fears were entertained that it would prove as great as Thorn Creek or Reibold. The first large wells in this pool were completed between the middle and last days of October, and for a time there was great activity in their vicinity and much attention paid to that section. But before the close of the year the pool was defined and its production on the down grade, the highest figures having been reached in November. The total pipe line runs from the district up to the close of the year were 96,977 barrels.

The production of the older Pennsylvania, New York and Macksburg fields declined steadily during the year. But the great Trenton Rock area in Northwestern Ohio was developing quite rapidly early in the year, extending its limits so as to cover a large portion of the counties of Allen, Hancock and Wood, the richest portion of the territory being in the last named county. This development had a very depressing effect on values in all fields for a time until it was announced that the Northwestern Ohio product was practically valueless as an illuminant, and therefore not to be classed with the product of the older fields.

The depression still continues in the Northwestern Ohio field, the crude oil bringing but 15 cents a barrel at the wells. There is promise of better times for the producers in that section, how-

ever, as their oil is being largely introduced for fuel in districts remote from the coal and natural gas regions, and a lively competition has begun, even, with coal near the places of its production. It appears now that there will, ere long, be a market for the entire production of the Trenton rock area for fuel and gas making purposes.

The statistical position in the New York, Pennsylvania and Macksburg, O., fields is shown in the following tables:

STOCKS IN THE REGION.

Total liabilities pipe lines December 3, 1887.....	28,357,073.54
Total liabilities pipe lines December 31, 1886.....	33,367,897.74
Decrease during 1887.....	5,010,824.20
Daily average decrease 1887.....	13,731
" " " 1886.....	1,613
" " " 1885.....	9,613
" " " 1884.....	3,162
" " " 1883.....	3,782

PIPE LINE RUNS 1887.

National Transit Co.....	14,787,614.63
Tidewater Pipe Co.....	1,978,213.24
Octave Pipe Co.....	28,695.55
Excelsior, 9 months.....	251,717.36
Pittsburg Pipe Line.....	1,186,147.52
Southwestern Pennsylvania Pipe Line.....	3,148,016.52
Atlantic & Western.....	123,663.90
Macksburg.....	320,072.19
Total pipe line runs 1887.....	21,824,140.91
Total pipe line runs 1886.....	25,791,915.00

Decrease.....	3,967,774.00
Daily average runs 1887.....	59,792
" " " 1886.....	70,663
" " " 1885.....	59,384
" " " 1884.....	64,668
Decrease 1887 from 1886.....	10,871
Increase 1886 over 1885.....	11,249
Decrease 1885 from 1884.....	5,284

REGULAR SHIPMENTS FROM THE PIPE LINES 1887.

National Transit Co.....	22,587,776.95
Tidewater Pipe Co.....	2,551,285.54
Octave Pipe Co.....	29,175.86
Excelsior Pipe Co., 9 months.....	241,211.08
Southwestern.....	427,106.75
Atlantic & Western.....	79,877.26
Macksburg.....	334,901.54
Total 1887.....	27,451,480.65
Total 1886.....	26,202,933.00

Increase in shipments 1887.....	1,248,546.65
Daily average shipments 1887.....	75,209
" " " 1886.....	71,789
Average increase per day.....	3,420
Daily average shipments, 1884.....	64,211
" " " 1883.....	60,185
" " " 1882.....	61,024

RUNS AND SHIPMENTS COMPARED.

Total shipments for 1887.....	27,451,481
Total runs for 1887.....	21,824,140
Excess of shipments over runs.....	5,627,341
Total shipments for 1886.....	26,202,933
Total runs for 1886.....	25,791,915

Excess of shipments over runs.....	411,018
Total shipments for 1885.....	23,806,846
Total runs for 1885.....	21,061,206

Excess of shipments over runs.....	2,745,640
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EXPORTS FROM THE UNITED STATES.

There was a fair increase in the amount of the petroleum products exported from this country during 1887 as compared with previous years, as will be shown by the following official figures of the Treasury Department at Washington:

Exports petroleum products 1887.....	580,463,229
" " " 1886.....	579,673,486
Increase.....	789,743
Average daily increase 1887.....	2,164
" " " 1886.....	89,119
" " " 1885.....	44,731

The above figures include about 99 per cent. of the total exports of petroleum

products. Reduced to crude equivalent in barrels they show up about as follows:

	Barrels.	Daily Average.
1887.....	17,045,300	46,669
1886.....	16,957,910	46,460
1885.....	16,392,259	44,910
1884.....	15,895,446	43,576

PRODUCTION.

For the purposes of this review the pipe line runs and deliveries direct to refiners must be taken as accurate enough to represent the production of the New York, Pennsylvania and Macksburg, O., fields, the products of which are placed in the same class and bring nearly the same prices. The following table shows this production:

	Barrels
Pipe line runs New York, Pennsylvania and Macksburg.....	21,824,140
Dump oil Allegheny Valley.....	128,036
Dump oil Washington.....	118,330
Private lines Washington, est.....	140,000
Macksburg shipments private lines.....	40,000
Dump oil Bradford.....	67,400
Clarendon.....	162,500
Grand Valley.....	145,000
Greene county.....	3,000
Other sections.....	100,000
Total production 1887.....	22,728,396
Daily average.....	62,270

PRODUCTION BY FIELDS.

	Total Production	Daily Average	Daily Average
	1887	1887	1886
Bradford.....	7,563,452	20,722	26,980
Allegheny.....	1,662,661	4,555	6,243
Cherry Grove.....	73,546	202	298
Cooper.....	141,155	387	552
Balltown.....	192,333	527	949
Baldrige, etc.....	2,028,728	5,558	1,941
Cogley, est.....	262,020	718	2,790
Red Valley.....	172,003	471	982
Tarkill, est.....	342,221	938	2,048
Pontius.....	588,370	1,612	2,620
Kane.....	708,464	1,941	3,520
Washington, est.....	2,859,344	7,834	6,627
Shannopin.....	690,500	1,892	1,580
Saxonburg.....	96,977	266	.....
Macksburg.....	360,072	986	1,933
Other fields, est.....	4,986,551	13,661	12,557
Total.....	22,728,396	62,270	71,620

	1886	1886	1885
Bradford.....	9,847,911	26,980	29,228
Allegheny.....	2,278,809	6,243	7,244
Cherry Grove.....	108,876	298	372
Cooper.....	201,455	552	934
Balltown.....	346,312	949	953
Baldrige.....	708,276	1,941	4,967
Cogley.....	1,022,294	2,790	3,048
Red Valley.....	358,391	982	.....
Tarkill, 9 months.....	559,564	2,048	.....
Pontius, 7 months.....	560,780	2,620	.....
Kane.....	1,284,647	3,520	.....
Washington.....	2,418,872	6,627	.....
Shannopin, 10 months.....	483,338	1,580	.....
Macksburg.....	705,671	1,933	1,682
Other fields.....	5,255,980	12,557	10,956
Total.....	26,141,176	71,620	59,384

	1885	1885	1884
Bradford.....	10,668,255	29,228	33,052
Allegheny.....	2,644,057	7,244	10,665
Cherry Grove.....	135,810	372	724
Cooper.....	340,925	934	2,745
Balltown.....	348,100	953	2,206
Wardwell.....	148,806	702	2,550
Baldrige.....	1,813,020	4,967	3,501
Cogley.....	701,001	3,048	.....
Other fields.....	4,261,232	10,254	8,996
Total.....	21,061,206	57,702	64,439
Macksburg.....	613,822	1,682	229
Total.....	21,675,028	59,384	64,668

	1884	1884	1883
Bradford.....	12,090,950	33,052	34,181
Allegheny.....	3,903,594	10,665	12,931
Cherry Grove.....	264,942	724	2,070
Cooper.....	1,004,849	2,745	3,001
Balltown.....	807,506	2,206	2,127
Wardwell, 9 months.....	701,226	2,550	.....
Baldrige, 9 months.....	962,801	3,501	.....
Other fields.....	3,842,992	8,996	12,493
Total.....	23,584,860	64,439	66,803

CONSUMPTION.

Taking again the pipe line figures as a basis for computation the total consumption for the year would be as follows:

Pipe line shipments	Barrels
Pennsylvania.....	27,451,481
New York and Macksburg.....	128,026
Dump oil Allegheny Valley.....	118,330
Dump oil Washington.....	40,000
Macksburg shipments private lines.....	67,400
Dump oil Bradford.....	162,500
Clarendon.....	145,000
Grand Valley.....	3,000
Greene county.....	100,000
Other sections.....	28,215,737
Total consumption.....	77,303
Daily average.....	

As the daily average of exports for the year was 46,699 barrels the daily average home consumption must have been about 30,704 barrels, a very gratifying increase over 1886, when by the same computation the daily average home consumption was about 26,286 barrels. The large production of white sand or "premium" oil has led to the production of large quantities of the fancy brands of illuminating oil, and this has been a principal cause in the increased home consumption, as from these high grade oils the best light in the world is produced. A light that is pleasant and healthful and much cheaper than its only competitor, the incandescent electric lamp.

The following tables give a comprehensive view of the fluctuations of prices:

THE CRUDE MARKET.

	1887				1886			
	Highest	Lowest	Fluctuation	Average	Highest	Lowest	Fluctuation	Average
January.....	72½	67¾	4¾	71	92¼	81½	10¾	88¼
February.....	69¾	59¾	9¾	63¾	84¾	74¼	9¾	80
March.....	65¾	61¾	4	63¼	80¾	71	9¾	77½
April.....	68¾	62¾	6	64½	78¾	70¾	7¾	74
May.....	67¼	61¾	5½	64	74¾	62	12¾	69¾
June.....	64½	60¾	3¾	62¾	71	62¼	8¾	67
July.....	61¾	54¾	7¾	59¼	68¼	64¾	3½	66
August.....	65	56¾	8¾	60	66	59¾	6½	62
September.....	74¾	62	12¾	67	66	61¼	4¾	63¾
October.....	75½	67½	8	70¾	67½	62¾	4¾	65½
November.....	75¾	69¾	6	73¾	80	65½	14¾	72
December.....	90¾	73¾	17	80	81¾	65½	16¾	71
For								
1887.....	90½	54½	36	66½				
1886.....	92¼	59¼	33¼	71¼				
1885.....	112½	68	44½	88½				
1884.....	115¼	51	64¾	83¾				
1883.....	125	84¾	40¼	105¾				
1882.....	135	49¼	85¼	78¼				
1881.....	100½	72	28½	85				
1880.....	124¾	70¾	53¾	94				

THE NEW YORK REFINED MARKET.

Prices of refined, standard white, in barrels:

	Highest	Lowest	Average
January.....	6¼	6½	6.72
February.....	6¼	6½	6.59
March.....	6¾	6½	6.62
April.....	6¾	6½	6.69
May.....	6¾	6½	6.68
June.....	6¾	6½	6.64
July.....	6¾	6½	6.51
August.....	6¾	6½	6.55
September.....	6¾	6½	6.66
October.....	6¾	6½	6.65
November.....	7	6¾	6.97
December.....	7½	7	7.21
Average for the year 1887.....			6.75
" " " 1886.....			7.07
" " " 1885.....			7.86
" " " 1884.....			8.28
" " " 1883.....			8.14

SUMMARY.

Briefly, stocks were reduced at a greater rate than ever before in the history of the trade, 5,010,824 barrels.

Production was decreased 9,350 barrels a day as compared with the previous year.

Shipments from the region were increased 4,557 barrels a day as compared with 1886 and were the largest ever known.

Exports were increased 239 barrels a day.

Consumption exceeded production at the rate of 15,033 barrels daily during the year.

The year 1886 was summed up as follows: The net stocks in the region were decreased during the year 590,338, equal to a daily average of 1,617 barrels.

The pipe line runs from the Pennsylvania and New York fields increased at the rate of 11,188 barrels a day. Including the Macksburg, Ohio, field the increase is 11,279 barrels per diem.

The shipments from the region were 5,145 barrels per diem greater than those of the preceding year.

The fire loss for 1886 was 48,991 barrels as compared with 9,101 barrels in 1885.

The exports of petroleum increased at the rate of 89,119 gallons a day.

The consumption of American petroleum exceeded the production by 1,126 barrels a day.

A TELEGRAM from Findlay denies that the producers of Northwestern Ohio are organizing a shut-down. The Findlay producers shut down last fall, but their neighbors over in Wood county kept on drilling. There has been a prodigal waste of oil, the telegram says, and Findlay operators will now resume operations because the others did not shut down when they did. It is presumed there will be a still more prodigal waste of oil.

Runs, Shipments and Stocks.

RUNS OR RECEIPTS.

PIPE LINE.	Nov. 1887.	Dec. 1887.
National Transit.....	820,071.25	919,953.65
Tidewater.....	103,822.41	116,986.79
Octave.....	1,641.50	2,529.73
Pittsburg.....	46,499.58	49,785.99
Southwest Penn'a.....	167,506.97	145,534.00
Atlantic & Western.....	45,366.19	47,545.29
Macksburg.....	19,901.83	17,079.08
Total.....	1,204,809.73	1,299,414.53
Daily average.....	40,160.32	41,916.59

In the above tables only oil received direct from the wells is taken into account.

DELIVERIES OR SHIPMENTS.

PIPE LINE.	Nov. 1887.	Dec. 1887.
National Transit.....	2,168,203.46	2,179,410.27
Tidewater.....	207,631.04	300,459.16
Octave.....	1,887.50	2,340.73
Pittsburg.....	46,845.27	50,622.81
Southwest Penn'a.....	33,816.19	16,843.60
Atlantic & Western.....	27,854.35	51,509.13
Macksburg.....	34,508.15	39,654.05
Total.....	2,520,745.96	2,640,839.75
Daily average.....	84,023.86	85,188.38

Daily excess of shipments over runs:

December.....	43,271.79
November.....	43,863.54
October.....	21,078.16
September.....	10,502.53
August.....	8,973.79

NET STOCKS.

PIPE LINE.	Nov. 30, 1887.	Dec. 31, 1887.
National Transit.....	27,077,138.48	26,150,737.69
Tidewater.....	1,440,020.81	1,281,531.22
Octave.....	2,350.27	2,539.27
Pittsburg.....	130,855.03	130,159.36
Southwest Penn'a.....	534,292.08	346,543.67
Atlantic & Western.....	45,875.42	41,180.30
Macksburg.....	426,957.00	404,382.03
Total.....	29,657,489.09	28,357,073.54

Net stocks decreased:

December.....	1,300,415.55
November.....	1,249,321.18
October.....	482,993.39
September.....	293,299.48
August.....	284,874.16

	Runs.	Shipments
Daily average December.....	41,917.59	85,188.38
Daily average November.....	50,160.32	84,023.86
Daily average October.....	63,486.36	84,564.52

Pipe Line Summaries.

Following is a comparison of the figures of the pipe lines for November and December:

NATIONAL TRANSIT CO.		Barrels.
Acceptances, etc., Nov. 30.....		20,850,036.15
Dec. 31.....		19,212,036.33
Decrease.....		1,637,999.82
Credit balances Nov. 30.....		6,227,102.15
Dec. 31.....		6,938,701.36
Increase.....		711,599.21
Total liabilities Nov. 30.....		27,077,138.48
Dec. 31.....		26,150,737.69
Decrease.....		926,400.79
Gross stocks Nov. 30.....		30,440,606.37
Dec. 31.....		29,410,666.53
Decrease.....		1,029,939.84
Sediment and surplus Nov. 30.....		3,363,467.89
Dec. 31.....		3,259,928.84
Decrease.....		103,539.05
Receipts from all sources Nov.....		1,242,638.04
December.....		1,287,015.27
Increase.....		44,377.23
Total deliveries November.....		2,183,888.00
December.....		2,208,289.47
Increase.....		24,401.47
Runs from wells November.....		820,071.25
December.....		919,953.65
Increase.....		99,882.40
Regular shipments November.....		2,168,203.46
December.....		2,179,410.27
Increase.....		11,206.81

The total receipts of the Transit Company for November were made up as follows:

Runs from wells.....	919,953.65
Received from other lines.....	367,061.62

Total..... 1,287,015.27

The deliveries for December were made up as follows:

Regular shipments.....	2,179,410.27
Delivered to others lines.....	28,879.20

Total..... 2,208,289.47

TIDEWATER PIPE CO.

Acceptances, etc., Nov. 30.....	664,000.00
Dec. 31.....	627,000.00
Decrease.....	37,000.00
Credit balances Nov. 30.....	776,020.81
Dec. 31.....	654,531.22
Decrease.....	121,489.59
Total liabilities Nov. 30.....	1,440,020.81
Dec. 31.....	1,281,531.22
Decrease.....	158,489.59
Gross stocks Nov. 30.....	1,595,303.73
Dec. 31.....	1,435,028.79
Decrease.....	160,274.94
Sediment and surplus Nov. 30.....	155,283.03
Dec. 31.....	153,497.57
Decrease.....	1,785.46
Receipts from all sources Nov.....	119,507.25
December.....	145,865.99
Increase.....	26,358.74
Total deliveries November.....	207,631.04
December.....	300,459.16
Increase.....	92,828.12
Runs from wells November.....	103,822.41
December.....	116,986.79
Increase.....	13,164.38

The above receipts for December were made up as follows:

Runs from wells.....	116,986.79
Received from other lines.....	28,879.20

Total..... 145,865.99

THE use of natural gas during 1887 displaced coal consumption to the value of \$9,800,000. Oil is now being introduced as fuel in districts where natural gas is not obtainable. Coal men should read the lesson of the times and turn their attention to cheap and convenient methods for converting their product into gas.

CAMBRIDGE, O., is just introducing natural gas as fuel. The town has been partially piped and the Court House is being heated by gas, it being one of the first buildings in which it was used.

AN UNFORTUNATE'S END.

A SPECULATOR WHO HAD BEEN PLAYING A LOSING GAME QUITTED IT.

BETWEEN 10 and 11 o'clock on the morning of Jan. 13, the body of a dead man was discovered in a room of the Rathbun House at Elmira. Blood was flowing from a bullet hole in his bosom, and near by lay the revolver from which the leaden messenger had been sent through his heart. The body was that of W. H. Johnson, a well-known stock and oil broker of New York, who had arrived at the hotel the day before. Among his effects were a gold watch and chain, one dollar and some small change. Mr. Johnson had been quite wealthy, but unsuccessful speculations had taken all of his money and property and it is supposed that he committed suicide because he despaired of ever retrieving his broken fortunes.

The news of Mr. Johnson's untimely and unfortunate death was received in the Exchanges with the greatest astonishment by all, as he was very well known, especially among the members of the Oil Exchanges, having at one time been one of the heavy rollers in the Bradford Exchange. He was born in Wellsville about thirty-two years ago and spent the first twenty-one years of his life at that place. In early life he was looked upon as a model young man, being a church member of good standing and liked and respected by all. He was engaged in offices of trust in the Wellsville Bank, and also in the City Bank, of Hornellsville. At 21 he came into possession of a large amount of property and from that time had engaged in a life of speculation.

Mr. Johnson first came to Bradford as agent for large tracts of timber land, afterwards entering the Exchange and becoming quite prominent. His career as a broker dates from 1880, and becoming firmly established in New York he held at one time the office of vice president of the New York Petroleum Exchange, No. 28 Broadway. He also held membership in the Oil City Exchange. Major W. G. Evans represented Mr. Johnson on the floor of the Bradford Exchange until the former's departure for New York, since which time S. H. Durston was his correspondent here and for a long time George W. Darr transacted his business on the Oil City Exchange. Mr. Johnson was a large operator on the market during his career here as broker and speculator. During the advance of 1885 he became noted as a bear until the market reached the dollar mark when he cast his fortune with the bulls and followed that play until \$1.12½ was touched. The heavy break in November of that year was too much for him and he succumbed, having been forced to the wall by the inability of his customers to meet their marginal obligations. Mr. Johnson subsequently settled his losses at 100 cents on the dollar. He had a large brokerage business from Hornellsville and Wellsville and was a large trader on the recent advance in oil, inclining to the bear side. He was always a good hearted man of the world, tasteful in his dress and fond of good living. He had a passion for the stage and it is said never missed a night at the theatre while in the city. He was interested for a time in the Union Square Theatre. About his last visit here was with the McCaull Opera Company. He

enjoyed a considerable amount of popularity. Reverses came at last and loss after loss followed each other until the young man was discouraged, and the last move in the market is said to be the cause of his rashly committing the act which caused his death.

A Good Word for a Good Paper.

Great corporate monopolies gain their ascendancy in the home market by the very simple plan of making it financially unprofitable to oppose their schemes. Occasionally there may be encountered some stubborn enthusiast who, for the sake of the right and the love of justice and fair play, will brave the adverse fortune to which a powerful monopoly might condemn any man who should persistently antagonize its methods and its ends; but as a general thing the individual is forced to retire before the steady and unrelenting pressure which his adversary can exert against him. There have been notable exceptions to this course of individual action, but these exceptions have been marked by qualities of management so rare that they need not be taken into account in determining the causes for the supremacy of monopoly in so many important departments of trade. In Bradford, for example, the oil producers are fortunate in possessing a daily newspaper—*The Oil News*—conducted by two newspaper men thoroughly familiar with the oil region and its requirements, whose opinions it would be impossible for the Standard oil monopoly to purchase. Yet *The Oil News* appears to be solitary in the oil country in its earnest and unsparing opposition to the methods of monopoly in oildom. The only difference between it and previous existing anti-monopoly journals in that section appears to be the interesting fact that it has not been possible to drive or freeze it out of its chosen field by any of the customary Standard devices of unscrupulous opposition. The publishing of an anti-Standard newspaper in the oil regions is a task in which the rewards must be limited, the temptation to go over to the side of monopoly constant. And so it is with all other forms of opposition to monopoly in the interests of the people. Yet there are to be found many honest men who prefer the public good to personal advantage; and these will form the nucleus of an anti-monopoly host that should in time be irresistible.—*Editorial in Philadelphia Record.*

A Gas Combination.

At a meeting in Pittsburg, on January 4, a combination of gas companies was effected under the title of the "Natural Gas Association," for the purpose of restricting production and drilling and maintaining "profitable rates." The companies included in the association are: The Royal, of Steubenville, O.; the Wheeling, of Wheeling, W. Va., and Bellaire, O.; the Mahoning, of Youngstown, O.; the Citizens, of Beaver Falls, Pa.; the Shenango, of New Castle, Pa.; the Natural Gas Company of West Virginia, of Wheeling; the Columbia, of Sharon, Pa.; the Home, of Youngstown, O.; the Bridgewater, of Rochester and Bridgewater, Pa.; the Ohio Valley, of East Liverpool, O.; the Ohio Valley, of Sewickley, Pa.; the Bellevue, of Bellevue, Pa.; the Mercer Gas Fuel, of Mercer, Pa.; the Lawrence, of Pittsburg, and all of the Guffey companies.

WELLS COMPLETED, 1887.

Month.	Allegheny.		Bradford.		Warren and Forest.		Lower Country.		Grand Summary.	
	Tot'l.	Dry.	Tot'l.	Dry.	Tot'l.	Dry.	Tot'l.	Dry.	Tot'l.	Dry.
January.....	4	0	15	3	39	7	101	27	159	37
February.....	6	3	13	1	37	4	91	16	147	24
March.....	3	2	9	5	52	33	84	33	147	44
April.....	3	0	16	10	32	31	98	33	163	43
May.....	3	1	15	11	52	10	64	22	146	36
June.....	3	1	23	9	63	9	64	22	179	35
July.....	3	2	31	0	48	7	91	25	162	37
August.....	3	0	10	1	45	12	94	25	132	37
September.....	3	2	13	1	33	10	78	21	130	34
October.....	3	1	3	3	36	10	70	29	114	29
November.....	3	1	3	3	19	12	82	29	104	44
December.....	3	1	3	3	13	3	81	25	99	44

Movements of Gas Companies.

The Citizens Natural Gas and Oil Company of Port Clinton, O., has been incorporated by Charles E. Payne and others, with a capital stock of \$10,000.

The Texas Gas and Oil Company has been organized at Waco, Tex.

Ross Reynolds, Jr., and others have recently organized the Armstrong County Gas Company at Kittanning, Pa., to compete with the old company there.

The Citizens Gas-Light and Fuel Company has been incorporated at Millers-town, Ala., Austin Fleeger and others are the projectors.

The Union Light and Fuel Gas Company, with a capital stock of \$5,000,000, has been organized at Chicago, Ill., by N. A. Haven and others.

The Citizens Gas and Pipe Line Company has been organized at Peru, Ind., to pipe gas to that place from Amboy. It has a capital stock of \$100,000.

The Vandalia Light and Fuel Company, capital stock \$40,000, has just been organized at Vandalia, Ill., by J. M. Whiteman, D. M. Clark and others.

J. V. McCarty and others have incorporated the Sterling and Rock Falls Natural Gas and Mining Company at Sterling, Ill.

The Dayton Natural Gas Company, of Dayton, O., has been organized.

The Carmel Natural Gas and Improvement Company, of Carmel, Ind., has filed articles of incorporation. J. T. McShane and others are the projectors. Capital stock \$10,000.

The Harrisburg Natural Gas Company, of Harrisburg, Pa., has let the contract for a well to be drilled near that city to a depth of 3,000 feet.

At the annual meeting of the Chartiers Natural Gas Company, at Pittsburg, the following Board of Directors was elected for the ensuing year: Jas. A. Chambers, President; James Langhlin, Jr., H. Sellers McKee, Adam Clark Dravo, Wm. H. Singer, Wm. E. Schmertz, Duncan C. Phillips, Calvin Wells, Mark H. Watson, Jas. M. Bailey, Daniel C. Ripley, Edward E. Denniston, John H. Dalzell.

A STOCK PALACE.

SOME POINTS ABOUT GEORGE V. FORMAN'S
FANCY IMPORTED CATTLE.

A GOOD many of the oil kings have diverted their attention to stock raising. A few have gone to the boundless west, forsaken the land where grease has been golden, and adopted the free life of the *ranchero* and become cattle princes on the plains, owners of vast estates and countless herds of broad-horned beefers. But others have turned their attention to improving the stock of the country by importing the best breeds. They have invested magnificent fortunes in Jerseys, Guernseys, Polled Angus and other fine breeds. Notable among these are Miller & Sibley, of Franklin, and George V. Forman, of Olean. Of the stock barns and cattle of the last-named gentleman a correspondent speaks as follows:

Just outside of the city limits of Olean, N. Y., on State street on a beautiful level farm of rolling lands are situated the immense and elaborate barns that form the home of a large family of thoroughbred Jersey cattle owned by George V. Forman. Mr. Forman, in October, 1885, completed the main barn, which is 264x46 feet, and displays great ingenuity on the part of the architect. The structure sets upon a solid foundation, formed of heavy building stone. The floor does not rest immediately upon the foundation wall, but a space of four feet intervenes between the floor and the wall for the purpose of pure ventilation. This space is not open, but provided with windows that may be opened or shut to suit the temperature. The building is as well heated and comfortable as any dwelling house, and it is surprising to see how neat and clean it is kept. From the street one would scarcely believe that so handsome and neat a structure was the home of cattle. The floor is of heavy plank, while the sides and ceiling are of pine lumber. The barn is well lighted by twenty-seven large windows on both sides and ventilation is secured by the large ornamental towers, one in the centre and one at each extremity of the structure. Along either side of the building are stalls large enough to accommodate one cow and so well regulated is it that everything works like clock work. For instance, the troughs used to feed them are suspended in front above the cattle's heads and lowered at time of feeding by the use of a rope, attached to which is a heavy weight. When not in use the trough is entirely out of the way. In front of every fifth cow there is a water faucet supplied by the main water line of the city. A cistern with a capacity of 5,000 gallons is situated on the west side of the barn for the purpose of holding the liquid manure, to which place it is conveyed in pipes. From here it is withdrawn and distributed over the farm, and proves an invaluable fertilizer.

Besides the large number of stalls there are four immense grain bins and a large feed-mixing department. The cattle all stand facing the center of the building, and for one to stand at one end of the structure and behold the heads of the beautiful creatures quietly chewing away at their cuds is one of the most charming pictures of nature. Every head is held erect and the glossiness of the hair and the contentment in the eyes of the innocent creatures clearly testi-

fy to the excellent care taken of them. Every cow has a separate stall and receives special attention. Over the front of the stalls is the name of the occupant in gilded letters. There is no doubt but that this is one of the finest collections of choice Jersey cattle in America.

Besides this main building there are two smaller ones constructed on the same plan. One of these buildings is used for a particular breed of cattle, namely, the Polled Angus, or Scotch cattle having no horns. These are fourteen in number. The other building is stalled off in large box stalls for the safe keeping of four or five large bulls. These are allowed to roam through the stall without being tied. One of these, Wolseley, imported P. S., No. 401, and 16,090, A. J. C. C. from Island of Jersey in October, 1884, is a Polled Angus and the only one imported directly from the Island.

In all the buildings there are 145 cattle, many of them costing \$1,000 and upward apiece. The cattle are pastured upon the farm and upon rented farms in the vicinity. In the winter they are confined to the barn most of the time, but during the rest of the year are every morning driven to pasture. Mr. Forman does not conduct this enterprise for profit merely, but because he has become greatly attached to the keeping of the creatures. He generally spends his winters in New York City and occasionally takes a trip to Jersey Island.

Mr. Batt McCarthy has charge of the cattle and has always proved himself a man of ability and to possess a thorough knowledge of his business. He keeps a number of assistants at work continually. The farm is under the supervision of Mr. J. Geise, who is thoroughly acquainted with his department of the business.

December Production Report.

Reports of the stocks at wells in the Bradford field received by THE PETROLEUM AGE show a decrease of 2.8 barrels to the well during the month of December. Stocks reported at wells in the Allegany field show a like decrease of 1.97 barrels per well. The total number of wells connected with the pipe lines in the Bradford field on December 1, was estimated at 14,100 and the number in Allegany field 4,000. From the above data it is found that the average daily decrease in stocks in the Bradford field was 1.273 barrels. In the Allegany field it is ascertained by the same computations that the stocks at the 4,000 wells decreased 254 barrels per day. The average daily pipe line runs from the Bradford field were 13,292 barrels and from the Allegany field 3,305 barrels. Subtracting the daily decrease in stocks from the pipe line runs the figures are tabulated as follows:

December daily average Bradford runs.....	13,292
Allegany ".....	3,305
Total runs both fields.....	16,597
Decrease Bradford stocks.....	1,273
Allegany ".....	254

Daily decrease both fields.....	1,527
December's estimated daily production Bradford and Allegany fields.....	15,070
November's estimated daily production Bradford and Allegany fields.....	16,780

Decrease in December..... 1,710
NOVEMBER PRODUCTION REPORT.

Reports of stocks from 5,016 Bradford wells show an increase of four barrels to the well during the month of November. Stocks were reported from about 800 wells in the Allegany field, and these

show an increase of 2.8 barrels in stocks at the wells during the month. The total number of wells connected with pipe lines in the Bradford field on November 1 is placed at 14,100, and the number in the Allegany field was 4,000. From the above data it is found that the average daily increase in stocks in the Bradford field in November was 1,880 barrels. In the Allegany field it is ascertained by making the same computation that the stocks at the 4,000 wells increased 373 barrels per day, making a total daily increase of 2,253 barrels. The total daily pipe line runs in both fields averaged about 14,527 barrels in November. Adding the increase in stocks the Bradford and Allegany production averaged about 16,780 barrels a day, of which it is estimated that 3,176 barrels were produced in the Allegany and 13,604 barrels in the Bradford field.

WARREN, FOREST AND LOWER COUNTRY.

Reports were received from groups of wells in the different sections of Warren, Forest and the Lower Country. The number of wells on the 1st of each month, with their averages, are contained in the following statement:

	No. wells	No. wells	Ar. per well	Ar. per well
	Dec 1	Jan 1	Dec 1	Jan 1
Clarendon and Tiona.....	67	75	21	23
Cooper District.....	130	172	25	34
Lower Country.....	222	173	72	41
Miscellaneous.....	54	22	35	12

As Macksburg oil is used in the same way as that of the fields of New York and Pennsylvania, there is no good reason why the Macksburg runs should not be counted in the runs of the oil regions. Hence they are included in the outside runs for November and December in making the following estimates on production:

Field.	November. Barrels.	December. Barrels.
Bradford and Allegany.....	16,780	15,070
Outside Runs, including Macksburg.....	25,634	25,320
Total.....	42,414	40,390
Decrease.....	2,024	

Compared with the month of December, 1886, there is a decrease of 27,400 barrels. The average daily production for the month of December, 1886, including the Macksburg field, was 67,790 barrels.

In the above estimates no account is taken of the "dump oil" loaded on the cars direct from the wells at Emlenton and other points in the region. The Lima runs by the Buckeye pipe lines were 15,570 barrels a day in December, 15,287 barrels a day in November, 14,353 barrels in October, 15,525 barrels a day in September, 15,834 barrels a day in August, 12,580 barrels a day in July, 15,818 barrels in June, 14,486 barrels in May, 11,760 barrels in April, 9,777 barrels in March, 7,394 barrels in February, and 4,226 barrels in January.

The following table shows the comparative production of the New York, Pennsylvania and Macksburg, O., oil fields for 1886 and 1887:

	1887.	1886.
January.....	63,086	57,272
February.....	63,724	57,840
March.....	63,392	59,764
April.....	63,447	63,027
May.....	63,253	68,198
June.....	62,275	74,454
July.....	60,005	73,887
August.....	59,121	70,657
September.....	60,145	78,228
October.....	58,942	77,009
November.....	42,414	72,695
December.....	40,390	67,790
Total.....	700,194	826,821

The Refined Market.

The refined market was active during December and prices advanced from the opening to the close of the month. The export movement for the month was one of the largest of the year and far exceeded that of December last year. Buying for export stimulated the advance in quotations. Notwithstanding the heavy increase in receipts at the seven principal Continental ports and London, the deliveries from those ports to the interior exceeded the receipts and the visible stocks suffered decrease. In fact, the foreign refined markets were quite as active as those of New York, Philadelphia and Baltimore, and considerable advances in prices were effected at all points. The greatest activity was noticeable about the close of the month, due, no doubt, to sympathy with the flurry in the crude market at that time.

Near the close of the month a New York writer spoke as follows of the situation:

The market for refined in barrels for export has been quiet during the week under review, though probably no more so than is to be expected during the holiday season. Prices continued steady at 7½c for 70 deg. Abel test until this morning, when an advance to 7¾c was announced, and this was also made the price for Philadelphia and Baltimore loading. As the speculative price for certificates took a further leap upward to-day, another advance in refined is naturally looked for, though it is not expected that any serious check will result in the movement in consequence. The sales reported for the five days comprising the week under review foot up about 30,000 barrels. The principal foreign markets also report an advance. To-day's quotations by cable were: Bremen, 7.50m; Antwerp, 18½@18¾; London and Liverpool, 6½@6¾d. Freight rates have undergone little change and hence to London 2s 3d remains the prevailing rate, while to Continental ports 2s 3d@2s 9d is the rate as to port. Home trade lots have been in fair seasonable request and are firm at an average advance of about ¼c. We quote 8½@8¾c for State legal test, 7½@7¾c for 110 test, 7¼@7½c for 120 test, 8@8½c for New York City 100 deg. flash, and 8½@8¾c for New York City 150 deg. water white. Western lots are held fully up to these figures.

Cases for export have received very little attention, the total sales reported amounting to less than 50,000. The price was to-day advanced to 9½c for plain tops. Freight rates are nominally unchanged. The rates for large vessels are: For Java, 25@26c; Japan, 22@23c; Calcutta, 20@21c; Bombay, 19c; Rangoon, 20c; Singapore, 22½@23c; Hong Kong, 21@22c; and for Shanghai, 29@30c.

Crude in barrels for export has been in increased demand and sales of 30,000 barrels are reported. Prices have been advanced to 6¾@7c, for Bradford and Parker respectively. Cases have continued in good request for export, with sales of about 50,000 reported. Prices have been advanced to 8¼@9c.

Prime city naphtha has remained steady at 7c. For export there has been very little demand with no sales reported.

Western residuum, 42@51 degree test, is quoted at 1½@1¾c f o b. Barrels are quoted at 5@5½c. No sales are reported for export.

William H. Samuel & Co., of Liverpool, England, report the visible supply

of refined petroleum on December 1 as follows:

	Barrels.
Europe (7 Continental ports)	1,249,049
London	236,279
Liverpool	134,830
Total	1,620,158

The same parties, under that date, say of the present position and future outlook:

The improvement which we recorded in our last and previous issues, and the continuance of which we further foreshadowed in our last issue, manifests itself in every direction, not only in petroleum oil but in almost all its products. No very heavy advance has been made in crude and refined petroleum, but what upward movements have been made exhibit a firmness that points much more conclusively to permanently higher prices than a more rapid and greater advance would.

The effect of the shut-down movement in the American producing districts has not yet been shown in figures, but there can be no doubt that during the next few months a very rapid diminution of the stocks of crude oil will be seen, and one of the principal factors in keeping down prices of petroleum products will thereby be rendered either non-existent or of less influence in that direction.

Mr. Geo. H. Lincoln's monthly circular gives the following figures on the clearances of refined petroleum, in cases, for China and the East up to the 31st of December for the years 1886 and 1887:

	1887 Cases	1886 Cases
China	1,543,029	2,538,077
Japan	2,708,002	1,856,594
India	3,104,748	4,235,274
Java, Singapore, etc.	2,612,811	3,481,173
Total December 31	9,968,590	12,111,118

REFINED QUOTATIONS FOR DECEMBER.

	New York	Philadelphia	Baltimore	Liverpool	London	Bremen	Antwerp
	Cts.	Cts.	Cts.	Pence	Reichmarks.	Francs	
1	7	7	7	6¼@¾	6.95	17¾	
2	7	7	7	6¼@¾	7.00	17¾	
3	7½	7½	7½	6¾	7.00	17¾	
4	7½	7½	7½	6¾	7.05	17¾	
5	7½	7½	7½	6¾	7.05	17¾	
6	7½	7½	7½	6¾	7.05	17¾	
7	7½	7½	7½	6¾	7.05	17¾	
8	7½	7½	7½	6¾	7.05	17¾	
9	7½	7½	7½	6¾	7.15	17¾	
10	7½	7½	7½	6¾	7.15	17¾	
11	7½	7½	7½	6 5-16	7.25	17¾	
12	7½	7½	7½	6 5-16	7.25	17¾	
13	7½	7½	7½	6 5-16	7.25	17¾	
14	7½	7½	7½	6¾@¾	7.30	17¾	
15	7½	7½	7½	6¾	7.30	17¾	
16	7½	7½	7½	6¾	7.25	17¾	
17	7½	7½	7½	6¾	7.25	17¾	
18	7½	7½	7½	6 3-16	7.25	17¾	
19	7½	7½	7½	6¾	7.25	17¾	
20	7½	7½	7½	6¾	7.25	17¾	
21	7½	7½	7½	6¾	7.25	17¾	
22	7½	7½	7½	6¾	7.25	17¾	
23	7½	7½	7½	6¾	7.25	17¾	
24	7½	7½	7½	6¾	7.25	17¾	
25	7½	7½	7½	6 7-16	7.50	18¾	
26	7½	7½	7½	6¾	7.30	18¾	
27	7½	7½	7½	6¾	7.25	18¾	
28	7½	7½	7½	6¾	7.35	18¾	
29	7½	7½	7½	6¾	7.35	18¾	
30	7½	7½	7½	6¾	7.35	18¾	
31	7½	7½	7½	6¾	7.35	18¾	

JOHN M. WESTCOTT, President of the Hoosier Drill Works at Richmond, Ind., has purchased a controlling interest in the Broad Ripple Natural Gas Company, supplying gas to Indianapolis.

THE Noblesville, Ind., field has excelled itself in the completion of the "Princess," the largest well in the field.

About Listing Certificates.

A New York special to the *Pittsburg Commercial Gazette* has this to say of listing oil on the New York Stock Exchange:

Stock Exchange brokers are taking a lively interest in the revived project of listing petroleum certificates and the general sentiment is so favorable to the plan that it is now considered certain that the Stock Exchange governors will approve it. The only obstacle that has hitherto stood in the way of listing these certificates was the refusal of the Standard Oil Company to register its certificates with a trust company. This difficulty, it is said, will soon be removed.

President Simmons, of the Fourth National Bank, and ex-President of the Stock Exchange, said: "I should consider the move a good one for the Stock Exchange. When trading in oil begins in the Stock Exchange the business will be divided with the Consolidated Exchange, and probably to the disadvantage of the latter. Still, it will broaden the speculative field, and may help rather than harm the Consolidated Exchange, for speculation grows in proportion to the number of persons who indulge in it."

Henry Clews spoke for a number of operators when he said: "The listing of these certificates is a wise move and will be a telling blow to the Consolidated Exchange. The heaviest traders in petroleum are members of the Stock Exchange who have hitherto been compelled to do trading through other exchanges. If they can they will trade on their own floor." Mr. Clews referred to the Consolidated Exchange as a retail shop which deals only in broken lots and whose effect on business is degrading.

Charles G. Wilson, President of the Consolidated Exchange, said: "The listing of petroleum certificates by the Stock Exchange will widen the market, and we look upon the move with pleasure. Our Exchange is composed very largely of oil producers and manufacturers who sell their stock for future delivery and they hail anything that looks like a better market for them. We may lose some trade, but increased interest will bring other customers to take the places of those who leave us."

The W. D. U. Holds Them Down.

Our Emlenton correspondent writes: There are no wells drilling in this section. There are no rigs building, and lately there is not much talk of operations. Some parties who had a disposition to play the hog and enjoy the benefits of better prices provided by others' sacrifices could find no drillers to work for them. The Well Drillers' Union owns this country and it is going to hold the key to the situation until November 1st. It has shut down and it proposes to stay shut down. The district here is one of the strongest in the region.

THE Broad Ripple Gas Company has submitted a proposition to heat the State House at Indianapolis for \$3,000 a year, the present cost for coal being \$5,000 to \$6,000. The Commissioners refuse to let the contract until the Consumers' Trust puts in a bid.

THE Hazelwood Oil Company, on January 3, paid its thirty-second quarterly dividend. The dividend declared on this occasion was 1½ per cent. Its property is principally located in the Bradford field.

A New Departure.

In order to afford the opportunity of a pleasant trip to Florida to every one who has the leisure to go, the Pennsylvania railroad company has arranged for personally conducted pleasure tours to that sunny land. The date of the second tour is fixed for Feb. 9. The tourists will be carried through to Jacksonville via Baltimore, Washington, Richmond, Wilmington, Charleston and Savannah by a special train of day coaches and Pullman buffet sleeping cars, running on a fast schedule. The tourist agent of the company, assisted by a chaperon, who will have a special care of the ladies unescorted, will direct the party. Round trip tickets, including sleeping car accommodations and meals en route in both directions, good for the return trip for fifteen days, will be sold at a rate of about \$45.50 from Philadelphia and \$45 from New York. The party in each case will be limited to 150 persons. Names may be entered on the lists at any time in advance. Detailed information as to the tour will be published within a few days.

Buffalo, Rochester & Pittsburg R. R.

The new short line between Buffalo, Rochester, Pittsburg, Cincinnati, Chicago, St. Louis, Kansas City, San Francisco and all points North, South, East and West.

For tickets, time tables and full information call on D. Lundergan, agent B. R. & P. depot ticket office, or at Main street ticket office in Riddell House block, Bradford.

Time table in effect Sept. 11, 1887.

Eastward.				Westward.			
12	10	STATIONS				9	11
Buff	Buff	Buffalo Division.				Br'd	Br'd
Mail	Ex.					Ex.	Mail
p m	a m					a m	p m
3 30	7 45	Lv	Bradford	Ar	11 15	8 05	
3 33	7 48		Kendall		11 12	8 02	
3 41	7 56		Limestone		11 04	7 54	
3 53	8 08		Carrollton		10 52	7 42	
4 31	8 46		Ellicottville		10 14	7 04	
4 40	8 55		Ashford		10 05	6 55	
5 15	9 30		Springville		9 30	6 20	
6 35	10 50	Ar	Buffalo	Lv	8 10	5 00	
p m	a m					a m	p m
Rochester Division.							
*2	4	STATIONS.				1	3+
acm	Rech					Mail	Br'd
Ex.	Ex.						Ex.
a m	p m					p m	p m
4 55	2 30	Lv	Bradford	Ar	12 30	10 25	
5 05	2 42		Limestone		12 18	10 14	
5 18	2 54		Carrollton		12 07	10 02	
5 26	3 09		Salamanca		11 51	9 41	
5 56	3 40		Ellicottville		11 20	9 23	
7 22	5 11		Gainesville		9 51	8 00	
7 44	5 34		Warsaw		9 27	7 35	
8 25	6 23		LeRoy		8 43	6 40	
9 25	7 15	Ar	Rochester	Lv	7 50	5 40	
a m	p m					a m	p m
Pittsburg Division.							
1	STATIONS.						4
Mail							Mail
p m							p m
12 55	Lv	Bradford	Ar	2 15			
3 26		Ridgeway		11 38			
4 51		Falls Creek		10 14			
4 58		Du Bois		10 08			
5 59	Ar	Punxsutawney	Lv	9 00			
p m							a m

*Leave Perry 7:00 a. m.

+Runs to Silver Lake and Perry without change.

Connections for East and West are made at Rochester with New York Central & Hudson River R. R., and at Salamanca with the N. Y. P. & O. R. R. for Jamestown, Mansfield, Cincinnati, Chicago and the West, at Ridgway with the Philadelphia & Erie R. R. for Emporium, Williamsport, Philadelphia and Baltimore, at Falls Creek with the Allegheny Valley Railroad for Pittsburg, Wheeling, Cincinnati, St. Louis and the West and South.

Thousand-mile tickets sold at two cents per mile.

J. P. THOMPSON, Gen. Pass., Agt., Rochester.

W. BARTLETT, Gen. Supt., Buffalo, N. Y.

TO MY PATRONS IN PETROLEUM REAL ESTATE.

As I expect to be absent from the city some portion of the time for the coming year, I have arranged with the well-known firm of C. P. Cody and Bro. for a joint interest with me in the future of the business under the firm name of the "Petroleum Real Estate Co., Limited." We are prepared to buy, sell and lease all kinds of oil and timber lands and city property, negotiate contracts and loans, and do a general commission business.

Information carefully given. Address Petroleum Real Estate Co., Limited, Lock Box 1, 275.

C. D. ANGELL.

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THE DAILY OIL NEWS,

St. James Place, Bradford, Pa.

PITTSBURG & WESTERN RAILROAD.

In effect Oct. 24, 1887. Central time. One hour slower than Eastern time.

NORTHERN DIVISION.

SOUTHBOUND TRAINS.					
STATIONS.	No. 7.	No. 23.	No. 25.	No. 17.	No. 19.
Bradford...Lv	A M	A M	A M	A M	P M
Mt. Jewett...				7 30	
Kane...				9 15	
Sheffield Junc.				10 10	
				11 04	
				P M	
Marienville...				12 12	
Tylersburg...				12 55	
Clarion Junction...			6 20	1 45	4 00
Clarion...			5 50	12 35	3 30
Shippenville...			6 30	1 58	4 14
Knox...			6 45	2 14	4 33
St. Petersburg...			7 24	3 04	5 20
Foxburg...		5 40	7 38	3 25	5 40
Parker...		5 50	7 48	3 36	
Bruin...		6 08	8 06	3 59	
Petrolia...		6 18	8 17	4 10	
Karns...		6 22	8 22	4 17	9
Millerstown...		6 36	8 36	4 32	
St. Joe...		6 50	8 50	4 45	P M
Butler...	5 15	7 18	9 30	5 20	1 50
Renfrew...	5 23	7 39	9 46	5 38	2 13
Callery Junction...	5 50	8 05	10 10	6 00	2 35
Allegheny...Ar	7 10	9 33	11 25	7 23	4 00

NORTHBOUND TRAINS.

STATIONS.	No. 34.	No. 8.	No. 18.	No. 24.	No. 25.
Allegheny...Lv	5 40	9 20	7 20	1 40	4 40
Callery Junction...	7 30	10 50	8 40	3 00	6 10
Renfrew...	8 02	11 12	9 00	3 21	6 33
Butler...	8 30	11 30	9 21	3 50	7 05
St. Joe...			9 50	4 15	7 38
Millerstown...			10 06	4 32	7 53
Karns...			10 20	4 45	8 06
Petrolia...		20	10 24	4 50	8 10
Bruin...			10 35	5 00	8 22
Parker...	A M	10 52	5 18	8 39	
Foxburg...	6 27	11 25	5 45	8 50	
St. Petersburg...	6 44	11 41	6 00		
			P M		
Knox...	7 49	12 32	6 45		
Shippenville...	8 11	12 53	7 02		
Clarion Junction...	8 30	1 14	7 15		
Clarion...	9 00	2 15	7 45		
Tylersburg...			1 48		
Marienville...			2 26		
Sheffield Junc.			3 06		
Kane...Ar			3 58		
Mt. Jewett...			4 40		
Bradford...			6 35		

No. 4 leaves Allegheny at 6 a m; Callery Junction, 7:30; Renfrew, 7:15; arrives at Butler 8:10 a m.

No. 29 leaves Butler 11:45 a m; Renfrew, 12:05; arrives at Callery Junction 12:25; Allegheny, 1:55 p m.

Westbound train leaves Callery Junction as follows:

Cleveland and Toledo express 8:35 a m; New Castle accommodation 3:05 p m; Chicago express, with through sleeping car, 1:44 p m; Zelenople accommodation 6:10 p m.

Sunday trains, Nos. 23, 25 and 29, run daily. On Sundays No. 24 will run 25 minutes late and connect at Callery Junction for New Castle. No. 29 one hour late and connect at Callery Junction with Chicago express.

Nos. 7 and 17 will run daily between Butler and Allegheny.

No. 50, Sundays only. Leaves Allegheny at 12:40 p m; Callery Junction, 1:50 p m; arrives at Renfrew 2:14; Butler, 2:35.

C. W. BASSETT,
General Passenger Agent.

Dunkirk, Allegheny Valley & Pittsburg.

Going North.				
	No. 2.	No. 4.	No. 6.	
Titusville...Lv	A M	P M	A M	
Grand Valley...	7 35	3 20	7 35	
Irvinton...	8 03	3 48	8 01	
Warren...	8 45	4 36	8 44	
Junction...	8 58	4 53	8 56	
Lilly Dale...	9 55	5 45	9 48	
Dunkirk...Ar	10 50	6 36	10 37	
	11 25	7 10	11 12	
Going South.				
	No. 1.	No. 3.	No. 5.	
Dunkirk...Lv	A M	P M	P M	
Lilly Dale...	9 25	4 00	2 40	
Junction...	10 03	4 38	3 14	
Warren...	11 02	5 45	4 08	
	11 55	6 44	5 03	
	P M			
Irvinton...	12 10	7 00	5 22	
Grand Valley...	12 58	7 49	6 12	
Titusville...Ar	1 20	8 15	6 40	

Bradford, Bordell & Kinzua R. R.

-AND-

Bradford, Eldred & Cuba R. R.

In effect May 22, 1887.

Westward.					
	p m	a m	Ar	Lv	a m
Bradford...	5 20	11 50		7 25	2 25
Kinzua Junc'n	4 45	11 15		8 05	3 05
Rew City...	4 36	11 08		8 13	3 12
Rixford...	4 13	10 48		8 31	3 28
Duke Centre...	4 08	10 43		8 36	3 33
Eldred...	10 10	3 50	10 25	8 55	3 50
Bullis Mills...	9 45	3 32	10 10	9 10	4 05
Ceres...	9 26	3 17	9 54	9 26	4 21
Little Genesee...	8 55	3 04	9 40	9 40	4 30
Bolivar...	8 40	2 55	9 30	9 50	4 45
Allentown...	7 50	2 34	9 06	10 14	5 09
lv. Wellsville...	7 00	2 05	8 35	10 45	5 40
Eastward.					
	a m	p m	a m	p m	p m
N. Y. L. E. & W. Hornellsville...	1 00	7 30		8 22	7 05
Elmira...					
Binghamton...					
Lv New York...	8 30	8 00		10 00	7 17
N. Y. L. E. & W.					
	p m	p m	a m	a m	p m
Bradford...	7 30		10 45	8 30	5 15
Kinzua Junc'n	6 55		10 10	9 10	5 55
Aiken...	6 47	10 02		9 17	6 02
Davis...	6 41		9 56	9 23	6 08
Simpson...	6 35	9 50		9 30	6 15
Ormsby...	6 25		9 40	9 40	6 25
Smethport...	5 50	9 05		10 15	7 00
Mt. Jewett...	5 50		9 05	10 15	7 00
Kane...Ar	5 15		8 30	10 50	7 35

PITTSBURG & WESTERN.

1 14			Clarion	12 35		
1 25			Foxburg	3 00		
10 52			Parker	3 10		
10 20			Petrolia	3 45		
9 18			Butler	5 25		
		Lv		Ar		
7 20	a m		Allegheny	7 20	p m	

Sunday train leaves Smethport at 8:25 a. m., arriving at Bradford at 10:00 a. m. Returning, leaves Bradford at 3:30 p. m., arriving at Smethport at 5:10 p. m.

J. N. C. McKENNA,
Supt. and Gen. Pass. Agt.

PHILADELPHIA & ERIE RAILROAD.

Time table in effect Nov. 15, 1886. Eastern standard time.

Eastward.					
	No. 18.	No. 8.	No. 4.	No. 12.	
Erie...Lv	A M	A M	P M	P M	
Corry...	7 35		2 45	5 25	
Irvinton...	9 00		4 13	6 55	
Warren...	9 50		5 00	7 50	
Kane...Ar	10 05		5 15	8 05	
Kane...Lv	11 25		6 30	9 15	
Johnsonburg...		6 25	6 55		
Emporium Junction...		6 58	7 30		
Lock Haven...		8 30	9 15		
		11 15	11 58		
Williamsport...		P M	A M		
Harrisburg...Ar		12 20	1 25		
Philadelphia...		3 13	4 30		
		6 50	8 25		
Westward.					
	No. 11.	No. 3.	No. 11.	No. 17.	
Philadelphia...Lv	A M	P M	A M	P M	
Harrisburg...		11 25	7 40		
		3 30	11 25		
Williamsport...			7 10	2 25	
Lock Haven...			7 58	3 15	
Emporium Junction...			10 30	6 25	
Johnsonburg...			12 00	8 02	
			P M		
Kane...Ar			12 40	8 35	
Kane...Lv		6 35	1 00	4 10	
Warren...		7 45	1 58	5 25	
Irvinton...		7 53	2 09	5 46	
Corry...		8 55	2 56	6 45	
Erie...Ar		10 10	4 00	8 05	

Trains daily except Sunday.

Through-car arrangement westward—Erie mail—Pullman palace sleeping cars Philadelphia to Erie, and Philadelphia to Williamsport (cars open to receive passengers at Philadelphia at 10 p m), and Washington to Williamsport. Passenger coaches Erie to Philadelphia, and Williamsport to Baltimore. Sleeping car Williamsport to Washington.

Niagara express—Pullman parlor car Philadelphia to Williamsport.

Through-car arrangement eastward—day express—Pullman parlor car Williamsport to Philadelphia. Passenger coaches Kane to Philadelphia, and from Williamsport to Baltimore.

Erie mail—Pullman sleeper Erie to Philadelphia, and Williamsport to Philadelphia (car open to receive passengers at Williamsport at 9 p m). Passenger coaches Erie to Philadelphia, and Williamsport to Baltimore. Sleeping car Williamsport to Washington.

WHEELING & LAKE ERIE RAILROAD.

Time table in effect Jan. 8, 1888. Central standard time.

Eastward.					
	No. 5.	No. 7.	No. 9.*	No. 1.*	
Toledo...Lv	A M	P M	P M	A M	
Oak Harbor...Ar	7 45	1 10	4 50		
Fremont...	8 41	2 05	5 45		
Clyde...	9 06	2 30	6 10		
Bellevue...	9 22	2 47	6 25		
Monroeville...Lv	9 37	3 03	6 40		
Norwalk...	9 55	3 20	6 58	3 10	
Wellington...	10 10	3 38	7 15	3 22	
Creston...	11 00	4 32	8 08	4 00	
	11 53	5 20	9 05	4 47	
	P M				
Orrville...Ar	12 20	5 48	9 40	*5 15	
Westward.					
	No. 12.	No. 10.	No. 8.	No. 6.	
Orrville...Lv	A M	P M	P M	A M	
Massillon...Ar	12 40	5 53	7 05	7 05	
Navarre...	1 20	6 35	7 52	7 52	
Valley Junction...Lv	1 20	6 35	7 52	7 52	
New Cumberland...	1 35	6 50	8 10	8 10	
Sherrodsville...	2 15	7 40	8 55	8 55	
Leesville...	2 28	7 53	9 10	9 10	
Bowerston...	2 40	8 05	9 25	9 25	
	2 48	8 13	9 40	9 40	
Canal Dover...	2 55	8 20	9 50	9 50	
	2 57	6 05			
New Comerstown...	3 38	6 45			
Cambridge...	4 38	7 45			
Macksburg...	6 09	9 15			
Marietta...Ar	7 25	10 25			
Westward.					
	No. 5.	No. 8.	No. 4.	No. 2.	
Marrietta...Lv	A M	P M	A M		
Macksburg...	6 00	12 10			
Cambridge...	7 15	1 24			
New Comerstown...	8 57	3 00			
Canal Dover...	10 00	4 00			
	10 42	4 40			
Bowerston...	11 25	3 45	5 55		
Leesville...	11 32	3 55	6 02		
Sherrodsville...	11 40	4 10	6 10		
New Cumberland...	11 52	4 25	6 22		
	P M				
Valley Junction...	12 20	5 02	6 45		
Navarre...	12 50	5 35	7 35		
Massillon...	1 05	5 50	8 00		
Orrville...Ar	1 40	6 25	8 55		
Creston...	1 45	*6 35	9 13		
Wellington...	2 18	7 02	9 42		
Norwalk...	3 05	7 43	10 33	A M	
Monroeville...	3 55	8 25	11 25	7 25	
Bellevue...	4 07	8 35	11 37	7 35	
	4 23	9 15	11 55	7 51	
		P M			
Clyde...	4 39	9 29	12 10	8 06	
Fremont...	4 55	9 45	12 28	8 23	
Oak Harbor...	5 20		12 53	8 45	
Toledo...Ar	6 20	*10 45	1 50	9 40	

HURON DIVISION.

Northward.					
	No. 25.	No. 27.			
Monroeville...Lv	A M	P M			
Norwalk...Ar					
Milan...Lv	7 00	3 55			
Friese Landing...Ar	7 25	4 20			
Huron...Ar	7 37	4 32			
	7 55	4 50			
Southward.					
	No. 26.	No. 28.			
Huron...Lv	A M	P M			
Friese Landing...	9 10	5 30			
Milan...	9 25	5 45			
Norwalk...Ar	9 45	6 03			
Monroeville...Lv	10 20	6 30			

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